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CONTENTS

LIVESTOCK FEED PROCUREMENT

Resources for Overcoming Feed Protein Deficit in Estonia
(O. Povetkin; SOVETSKAYA ESTONIYA, 7 Jul 83)..... 1

Feed Protein Production Potential in Estonia Discussed at
Agroprom Meeting
(SOVETSKAYA ESTONIYA, 3 Aug 83)..... 5

LIVESTOCK

Party Secretary Reviews Production Efficiency of Uzbek
Livestock Sector
(Ye. A. Aytmuratov; PRAVDA VOSTOKA, 4 Aug 83)..... 7

Economic Factors Affecting Milk Production Efficiency
(Nurambik Giniyatovich Araslanov; EKONOMIKA SEL'SKOGO
KHOZYAYSTVA, No 7, Jul 83)..... 13

Estonian Meat, Milk Procurement Data Reflect Gains
(SOVETSKAYA ESTONIYA, 16 Sep 83)..... 24

Progress, Problems in Introduction of Modern Hogbreeding
Methods
(N. Kozlo; SVINOVODSTVO, No 8, Aug 83)..... 29

New Livestock Raising Technology Discussed
(ZHIVOTNOVODSTVO, No 7, Jul 83)..... 33

REGIONAL DEVELOPMENT

Modern Status of Agricultural Science Discussed (P. P. Vavilov; VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, No 6, Jun 83).....	39
Work of VASKhNIL Presidium Sessions Discussed (VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, No 6, Jun 83).....	52

AGRO-ECONOMICS AND ORGANIZATION

Regional Specialization, Distribution of Agricultural Production Advanced (D. Vermel', S. Tolpygin; EKONOMIKA SEL'SKOGO KHOZYAYSTVA, No 7, Jul 83).....	59
Development, Prospects of Subsidiary Industrial Enterprises Discussed (Oleg Nikolayevich Artynskiy; ZHURNALIST, No 6, Jun 83)....	74
Procurement Price Markups on Livestock, Crops in Kazakhstan Analyzed (Ye. Sembin; NARODNOYE KHOZYAYSTVO KAZAKHSTANA, No 7, Jul 83).....	81
Bank Loans, Cost Effectiveness on Ukrainian Kolkhozes Discussed (V. Pilipas, D. Polozenko; EKONOMICHESKAYA GAZETA, No 30, Jul 83).....	86

LIVESTOCK FEED PROCUREMENT

RESOURCES FOR OVERCOMING FEED PROTEIN DEFICIT IN ESTONIA

Tallinn SOVETSKAYA ESTONIYA in Russian 7 Jul 83 p 2

[Article by O. Povetkin, special correspondent for SOVETSKAYA ESTONIYA: "They Grow as on Yeast. Some Aspects of the Comprehensive Program 'Protein'"]

[Text] How can the production of milk and meat production be increased without expanding the areas under cultivation for feed? This question increasingly troubles the peasant. And at the July (1983) Plenum of the CPSU Central Committee the necessity for providing for the most rational utilization of the production and scientific-technical potential in agriculture was stressed.

Farm lands are not limitless. Increasingly more serious competition for them has been made recently by growing cities, settlements, new roads, enterprises, resort institutions and rest areas, requiring no small territory. Thus, it is incumbent upon feed producers and, perhaps, agriculture as a whole, to search primarily for intensive factors in overcoming the feed deficit for cattle.

This deficit is rather large. Thus, the farms of our republic during the year require an additional 41,000 tons of feed protein alone, the need for commercial production of which on a national scale was again emphasized at a session of the CPSU Central Committee Politburo. This protein is necessary in order to balance the quantity of other feeds and raise their assimilability.

What are the reserves for raising the protein reserves for animal husbandry in the republic?

"Under the conditions in Estonia," says doctor of biological sciences, chairman of the commission on the scientific bases of the food program, ESSR Academy of Sciences, E. Parmasto, "the large-scale industrial production of feed protein is presently impossible because large enterprises are also required for this, demanding very high expenditures of resources and manpower. Neither are there sufficient raw materials from which protein can be produced. Such raw material as peat, true, is available, but the appropriate technology for processing it is not yet present. Furthermore, its processing involves the use of a large quantity of acids and therefore is rather toxic. We also have little wood. In my view, our most important reserve for the production of feed protein is an increase in the productivity of fields and the improvement of methods for harvesting grasses. Especially grasses with a high protein content--clovers, lucernes and milk vetch."

I more than once had occasion to see how clover leaves, the most nutritive portion of the plant, fell directly from under the blades of a mower onto the ground. I also had to contend with the stubborn refusal of farm supervisors to plan promising varieties of feed crops. Meanwhile, it has long been known that the foregoing pulse crops, in addition to their other merits, not only accumulate considerable nitrogen but also deposit it in the soil, thus introducing a necessary fertilizer.

It should be added here that the introduction of pulse crops in rotation might proceed more rapidly if there were not problems with the seed fund. Under the conditions in Estonia their seeds do not ripen every year. Conversations are now underway with the republics of Central Asia, where the climatic conditions make it possible to obtain guaranteed harvests of pulse-crop seeds. If successful, the problem of providing the republic's farms with a seed fund will be solved.

The second reserve named by E. Parmasto is the utilization of that which is already produced and is in storehouses and warehouses. A portion of the combined feeds, for example, should be transferred from the poultry funds to the funds of a more profitable branch, i.e. animal husbandry, thus restoring the imbalance between the production of cattle and poultry meat.

The question still has not been decided concerning the utilization of separated milk. The essence of the dispute lies in the purposes for which it is preferable to release it for cattle feed or for the cheese industry. The question is difficult and represents a kind of closed circle: more separated milk for cattle, less cheese and vice versa. The same holds for whey.

Here we logically approach the third reserve protein production under industrial conditions. Some steps are being made in this direction. And above all the farms themselves. At Kekhtnaskiy support-demonstration sovkhos-tekhnikum feed yeasts are successfully produced from peat. True, in small quantities. At Kuusalu Kolkhoz they are working on the yeasting of whey and thus provide good additives for hogs. At Pyanu a rich protein juice is obtained from young grasses. A similar shop will be constructed at Vyaik-Maar'ya Kolkhoz. And although all these measures are primarily experimental, they nevertheless will yield very much. In particular, practical experience in the production of feed protein under industrial conditions.

And so, two main sources of supplementary funds of protein feeds are available for cattle. These are fields, on the one hand, and, on the other, peat bogs, forests and food-industry wastes. The first source is comparatively cheap, since it is sustained by free energy, by solar energy. The question is only one of how to raise the productivity of the fields and to maintain its gifts. But the industrial processing of various raw materials into protein requires in large quantity expensive electrical and heat energy, highly-trained specialists and equipment. And it is this that must be considered.

Let us consider a concrete example.

Kuusalu Kolkhoz of Khar'yuskiy Rayon. A shop was constructed here and is in the third year of operation transforming milk whey into highly-nutritive biomass.

The farm receives milk products of 20 tons whey daily from Tallinskiy Combine and for each ton produces a ton of biomass, one for one. The technology of production is rather complex. Therefore, only the main features are explained. Bacteria are cultivated in the shop laboratory, supplied with the latest equipment. Their addition to whey evokes a lactic-acid fermentation, as a result of which a biomass is obtained with a high protein content.

An experiment was conducted at the farm, the essence of which I will attempt to convey. A number of feeder pigs were separated and divided into four groups. The first (experiment) received as an additive the biomass from the shop; the second was fed hydrolyzed yeasts; the third, protein of plant origin; and the fourth was maintained as were all pigs at the farm until the opening of the shop, that is until 1980. The major experimental criteria were: average daily weight gain, feeding time until market weight, feed expenditure per day and the cost of one kilogram weight gain. The results: the first group showed 708 grams weight gain per day, reached market weight in 99 days, consumed 3.09 feed units per kilogram weight gain and the cost of a kilogram of meat here was 72 kopecks. The second group gained 673 grams per day, the market weight was gained in 104 days and 3.22 feed units were consumed. The third group: respectively 571 grams per day, 123 days and 3.63 feed units; the fourth: 412 grams, 170 days and 6.96 feed units. The cost was much higher in all three control groups than in the experimental group. Especially in the fourth--1.141 rubles.

In 1982 thanks to the feeding of biomass obtained from whey, the kolkhoz produced an additional 241.8 tons of pork. That is, 32.9 percent above plan. Note that this is without increasing the quantity of feeds. An additional income of 584.1 rubles was obtained for meat production; 962 tons of grain, 32 train cars, were saved. An entire train! Percentnerweight gain 98 feed units were saved, the herd turnover declined from 270 to 204 days (by 24.4 percent) and the cost of a centner of pork fell from 141 rubles 60 kopecks to 114 rubles 25 kopecks (by 19.3 percent).

Nevertheless, as it is believed here, the capacity of the shop is insufficient. The kolkhoz needs an additional 20 tons of whey per day for all 10,000 pigs to receive completely balanced rations. A second shop will be constructed for whey processing, already with more advanced equipment. It has been calculated that the additional impact will be appreciable.

Deputy chairman of Kuusalu Kolkhoz V. Makarov, a great enthusiast for protein production by industrial means, declared that whey is not the only form of raw material for supplementing feed rations with protein additives. It is necessary only to learn to find and use such raw material. Of course, milk whey is available in limited quantities; there is not enough for all. But on the other hand there is peat molasses, protein-containing grass juice, acidophilic bacteria, the wastes of starch and lumber production and straw from fields, eight kilograms of which contain a kilogram of valuable feed, including 21-24 percent proteins and 30 percent lignin. The biological value of the protein obtained as a result of its conversion is 60 percent, while the assimilability by the animal organism is 67 percent.

What conclusion is suggested by the foregoing? Perhaps there is one: the protein deficit, now comprising 10-12 percent in the republic, can be liquidated only with the rational use of those raw resources that are already available but for some reason are not being made use of. In other words, one must now determine the equipment, technology and other means in order to realize effectively this richness. The more so now that practical results have already been obtained.

"A precise economic analysis of the possibilities of the industrial production of feed protein is needed," says E. Parmasto. "Our Economics Institute and the ESSR Agricultural Industry are now involved with its composition following the recommendation of the Commission on the Scientific Bases of the Food Program, ESSR Academy of Sciences.

9942

CSO: 1824/501

LIVESTOCK FEED PROCUREMENT

FEED PROTEIN PRODUCTION POTENTIAL IN ESTONIA DISCUSSED AT AGROPROM MEETING

Tallinn SOVETSKAYA ESTONIYA in Russian 3 Aug 83 p 3

[Unsigned Article: "At the Center of Attention, the Production of Protein: At the Presidium of the ESSR Agroprom"]

[Text] The 1983-1990 program for the production of animal and microbiological protein in our republic was discussed at a meeting of the ESSR Agroprom Presidium which convened on 2 August in Tallinn.

The document approved by the meeting noted that in fulfilling the decisions of the Estonian Communist Party Central Committee's 7th Plenum and in systematically intensifying animal husbandry, there should be a sharp increase in feed protein production from meat-dairy, food and wood processing industry wastes, peat and potato cell sap. Progressive experience of specialists from many nations indicates that this can not only eliminate, to a great extent, the shortage of protein in livestock rations, but also transform many agricultural production sectors into waste-free ones. For example, at the "Ranna" Sovkhoz heat treated and ground up wastes from poultry production serve as a raw material for by-product production. As a result of their utilization the sovkhoz has considerably increased the average daily weight gain of broilers and livestock without substantial additional outlays.

A number of feed production facilities at the republic's meat and canning combinats will now be rebuilt. However, it was stressed at the meeting that it is now essential to create such production departments at all appropriate enterprises. At food industry enterprises waste waters from plants producing yeast, starch, juices, etc., could serve as raw materials. Many sectors have great potentials for expanding microbiological output. From 1 ton of wood wastes the nation's plants obtain up to 200 kilograms of valuable feed yeasts. It is planned to build such an enterprise with a capacity of 3,000 - 5,000 tons of feeds annually at the "Vyru" Sovkhoz. Specialists at the "Kekhtna" Support Demonstration Sovkhoz-Tekhnikum have good experience in the production of liquid feed yeasts from peat. They plan to continue research in this area.

In cooperation with scientists from the USSR Academy of Sciences processes are also being developed to obtain low cost protein from potato cell sap, poultry manure and other sources. The meeting noted the necessity of more rationally using existing resources of animal feed protein.

Information was also heard about the implementation of capital construction plans for the first half of 1983 and the quality of ESSR Agroprom construction projects. Although construction organizations have, for the most part, fulfilled their tasks, they nevertheless have not been able to put a number of important projects into operation on schedule. The meeting obligated the managers of the republic agroindustrial association, construction organizations and farms to strengthen control over work quality and to take measures to liquidate shortcomings.

I. Kallas, the head of the Estonian Communist Party Central Committee's Agriculture and Food Industry Department, participated in the meeting's work.

11,574

CSO: 1824/535

LIVESTOCK

PARTY SECRETARY REVIEWS PRODUCTION EFFICIENCY OF UZBEK LIVESTOCK SECTOR

Tashkent PRAVDA VOSTOKA in Russian 4 Aug 83 p 2

[Article by Ye. A. Aytmuratov, secretary of the Central Committee of the Communist Party of Uzbekistan: "To Maximally Raise Labor Productivity in Animal Husbandry"]

[Excerpts] The further advance of agriculture, primarily an increase in the production of meat, milk and other livestock products, holds a special place among the immediate tasks advanced by the 26th party congress and the May (1982) and June (1983) Plenums of the CPSU Central Committee for the 11th Five-Year Plan and for the period until 1990.

Animal husbandry in the republic has become one of the leading sectors of the food complex and now accounts for almost 20 percent of the gross output of agriculture. Two and a half years of persistent labor on the fulfillment of the decisions of the 26th CPSU Congress and of the 20th Congress of the Communist Party of Uzbekistan have passed. During this period the average annual production of meat in the public sector, as compared with the level of the 10th Five-Year Plan, has increased by 26 percent, of milk, by 25 percent and of eggs, by 31 percent. The purchases of these products have risen accordingly.

The increase in output has been attained mainly as a result of the sector's intensification on the basis of production specialization and concentration and the transfer of animal husbandry to an industrial basis. In the last few years powerful complexes for cattle fattening and poultry farms have been put into operation and an extensive network of interfarm enterprises for beef production and for the raising of young replacement stock has been established. The population of all types of livestock and poultry has increased considerably and their productivity has risen. The feed base of animal husbandry has been strengthened, sown areas have been expanded and the yield of fodder crops has risen. During this time the republic's animal husbandry has been reinforced with highly skilled personnel--big experts in their jobs.

The achievements of animal husbandry gladden all the republic's workers. However, a great deal must still be done. The tasks set before farm workers by the 9th Plenum of the Central Committee of the Communist Party of Uzbekistan demand even better and more productive work.

At sections at present water supply is mechanized only 68 percent, feed distribution, 48 percent, manure removal, 55 percent and cow milking, 51 percent. In the last 7 years the fixed productive capital in the animal husbandry of the republic's kolkhozes and sovkhoses has increased 1.7-fold. However, labor expenditures on the production of a unit of output have been reduced by only 6 to 18 percent. Average annual labor productivity during the current five-year plan has increased by only 6 percent as compared with the 10th Five-Year Plan.

The organization of a rational and highly productive utilization of the machinery and equipment available at sections requires special attention. Unfortunately, on some kolkhozes and sovkhoses, owing to a careless attitude toward equipment and its poor operation, machinery and equipment get out of order prematurely and do not give the proper return. There are also cases when, with availability of the appropriate mechanization equipment, many operations are performed manually at sections. This leads to high expenditures and low productivity of labor and to a decline in the efficiency of animal husbandry.

On farms in the Kara-Kalpak ASSR gross livestock output worth only 1.22 rubles is produced per man-hour, in Fergana Oblast, 1.39 rubles and in Andizhan and Kashka-Darya Oblasts, 1.47 rubles, which is 19 to 32 percent lower than the average republic indicator.

Party, Soviet and economic bodies must fundamentally improve work on an increase in the efficiency of animal husbandry and a decrease in labor and material expenditures on output. It is necessary to systematically improve the organization and recording of labor, to ensure a rational utilization of all available equipment and to improve the engineering service and technical servicing of sections.

The Central Committee of the Communist Party of Uzbekistan and the Uzbek SSR Council of Ministers adopted a decree on measures for the further rise in the level of mechanization of animal husbandry and of the technical servicing of animal husbandry complexes, poultry farms and sections of the republic's kolkhozes and sovkhoses. Kolkhozes, sovkhoses, the Uzbek SSR State Committee for Supply of Production Equipment for Agriculture, Uzbek SSR ministries of agriculture and of fruit and vegetable industry and their local bodies should take every measure to fulfill this decree and on this basis to attain a sharp reduction in expenditures of manual labor and an increase in the economic efficiency of animal husbandry.

The task of the republic's agricultural ministries and departments, kolkhozes and sovkhoses is to ensure a constant good working order and highly productive utilization of mechanization equipment at sections and during the harvesting, procurement and processing of feed for the purpose of reducing the expenditures of live labor and lowering production costs. It is necessary to intensify attention to the training of machine operating personnel for animal husbandry sections and to increase their interest in and responsibility for a continuous operation of mechanisms. The training of service personnel in the process of installation and assembly of equipment at sections must be expanded.

During the current five-year plan it will be necessary to fully mechanize water supply for cattle barns and cow milking and to raise the level of mechanization of feed distribution to 65 percent and of manure removal to 80 percent. The level of mechanization should rise not only as a result of new construction, but also the reconstruction of existing barns. The bodies of the Agricultural Equipment Association should play an important role in the rise in labor productivity in animal husbandry. They are called upon to organize the repair and technical servicing of sections and their provision with spare parts and repair materials and to help kolkhozes and sovkhoses in a highly productive utilization of machinery and equipment.

Under our conditions a rise in the productivity of animals and, as a result of this, an increase in production volumes are some of the main factors in labor productivity growth in animal husbandry. Extensive work in this direction is being done in the republic. The purity of the breed of livestock and poultry is being improved, the herd structure is being refined and the level of zoo-veterinary servicing and the provision with feed and barns are rising.

For the most part, poultry and hog breeding and cattle fattening at complexes have been transferred to an industrial basis. They are based on flow production technology, which makes it possible to greatly increase their economic efficiency. An increase in production efficiency in dairy cattle breeding is also the most complex task.

Dairy cattle breeding is being transferred to an industrial basis in stages through the construction of dairy complexes and reconstruction of existing sections into bigger ones so that it may be possible to introduce a single production line with an overall mechanization of labor intensive production processes. In the republic dairy sections exist on almost all kolkhozes and sovkhoses. Intrafarm specialization and consolidation of sections take place here.

New standard barns for 200 head with overall mechanization, where every milkmaid can service from 50 to 100 cows, are being built. This type of cow house has proved its value in all the republic's oblasts and it should be introduced on a larger scale.

Improvement in the technology and organization of milk production through the introduction of the flow shop system is one of the advanced directions in an increase in labor productivity and in the efficiency of work in dairy cattle breeding. Such technology is being introduced extensively on many farms in Akhangaranskiy, Pastdargomskiy and a number of other rayons.

On the Besharyk Sovkhoz in Kirovskiy Rayon, Fergana Oblast, in the last 2 years the introduction of the new system of management of dairy husbandry has made it possible to increase the milk yield per cow by 620 kg, to raise the output of calves per 100 cows to 99 head and to increase labor productivity by 17.6 percent. On the Uzbekistan Kolkhoz in Pastdargomskiy Rayon after the introduction of flow shop technology the dairy productivity of cows rose by 173 kg, the output of calves per 100 cows increased by 17 head, totaling 96, and labor productivity rose by 9 percent.

In the republic more than 55 sections have adopted the flow shop system of management of dairy husbandry and in most oblasts measures for the introduction of this advanced technology have been developed and base farms and the dates of their transfer have been determined.

Ministries of agriculture and of fruit and dairy industry, Glavredazirsovkhozstroy, the Uzbek SSR State Committee for Supply of Production Equipment for Agriculture and local party, Soviet and agricultural bodies must more persistently introduce the new technology of production of livestock products based on the flow shop organization of labor. At the same time, special attention should be paid to the observance of all technological methods of production, high-grade feeding of animals and their proper care, selection, training and improvement in the skill of personnel and refinement in the organization and remuneration of labor with a view to increasing the dairy productivity of cows to 3,000 or 3,500 kg by the end of the five-year plan.

Intensive breeding, shortening of the periods of fattening and increase in the weight standards of livestock to 450 or 500 kg are the main ways of increasing the efficiency of dairy husbandry. The Kattakurgan Animal Husbandry Complex is one of the best farms for the raising and fattening of cattle. The high level of mechanization and automation of production processes on this farm ensures a significant growth of labor productivity and of the productivity of animals and an efficiency of feed utilization and contributes to a sharp reduction in material and monetary assets per unit of output. In 1982 a total of 23,000 head of cattle were raised and fattened there, the production cost per quintal of weight gain was 97 rubles, labor expenditures amounted to 6 man-hours, feed expenditures were 6.7 quintals of feed units and 20 kg of weight gain and gross output worth 25.8 rubles per man-hour were produced. These are very high indicators. Everything must be done so that our animal husbandry farms may attain the same high production efficiency.

A great deal will have to be done to increase labor productivity in sheep breeding. In this sector only sheep shearing and water feeding have been mechanized fully. It is necessary to more rapidly complete the mechanization of such technological processes as the slaughtering of lambs, cleaning of karakul skins, fattening of sheep and production of Persian lamb on an industrial basis, as well as feed procurement, and to introduce the brigade contract and the unregulated wage system for shepherds.

Significant potentials for an increase in production efficiency also exist on hog and poultry breeding farms. Pulling lagging brigades and farms up to the level of advanced ones, maximally utilizing existing capacities, preventing diseases and waste of young stock and increasing average daily gains and feed conversion efficiency are the main factors here. Uzglavzagotzhivprom and Uzpiti-seprom must sharply improve the level of management of their farms and on the basis of refinement in technology attain a further increase in output and in production efficiency.

An increase in the production of livestock products reflecting the level of labor productivity depends primarily on the sufficiency of high-quality feed and on its rational utilization. A great deal has also been done in this direction. On the basic area cotton-alfalfa crop rotations have been mastered,

companion and alternate crops are used extensively, better high-yielding varieties of fodder crops are introduced and specialized grain-livestock and corn growing sovkhozes have been established. On farms about 2,500 feed shops have been built and units for the preparation of vitamin grass meal and granules and installations for the production of chlorella and whole milk substitutes operate.

The transfer of feed production to an independent specialized basis and its full subordination to the interests of animal husbandry should be urgent tasks in this sector. It is necessary to persistently raise the standard of farming, to increase the yield of fodder crops, to improve the forms of organization and remuneration of labor, to introduce the collective contract and to make the financial interest of workers at feed extracting subdivisions directly dependent on the end result of section work. All the means and possibilities must be utilized to obtain no less than 100 quintals of feed units per hectare of fodder crops. Feed must be balanced in all nutrients. For this it is necessary to improve the structure of sown areas of fodder crops and to bring it in correspondence with the required feed assortment. Serious attention must be paid to the preparation of fodder for feeding and the capacities of feed shops must be utilized more fully.

The enterprise and business-like efficiency of personnel and their ability to creatively search for ways of obtaining the highest end result play an important role in the implementation of the outlined program for an increase in the efficiency of animal husbandry and in labor productivity. The qualitative composition of heads and brigade leaders of livestock sections has improved significantly in the last few years. The proportion of specialists among this category of workers on kolkhozes and sovkhozes has reached 63 percent as compared with 45 percent in 1975.

It must be noted, however, that in a number of oblasts, many rayons, kolkhozes and sovkhozes insufficient attention is still paid to the reinforcement of animal husbandry with skilled personnel, as a result of which the number of specialists among section managers grows slowly. On kolkhozes in Andizhan and Fergana Oblasts 52 to 56 percent of the heads and brigade leaders of sections do not have specialized education. Practical workers on sovkhozes in Dzhizak and Khorezm Oblasts hold 45 to 55 percent of these positions. The qualitative composition of operators engaged in mechanical cow milking, in livestock fattening and in poultry servicing is improved slowly.

Rayon party committees, local Soviet and agricultural bodies and party organizations of kolkhozes and sovkhozes must activate work with animal husbandry personnel and more rapidly see to it that every livestock section and brigade are headed by experienced and politically literate specialists and skillful organizers and educators of labor collectives capable of managing production on a modern scientific and technical basis. It is necessary to improve work on the utilization of graduates of higher educational institutions and tekhnikums, to increase the interest of specialists in changing to work at sections and brigades and to do everything to retain young specialists in rural areas.

Scientists must give efficient help to livestock breeders. The republic's party organization manifests constant concern for the development of science and strengthening its role in the transfer of production to a modern scientific and technical basis. Principles have been determined and recommendations have been given for the most rapid transfer of the economy to an intensive way of development on the basis of the establishment of fundamentally new technologies, rational utilization of raw materials and all types of products and shortening of the periods of introduction of scientific studies. Proceeding from this, in animal husbandry it is necessary to intensify investigations on the development and introduction of advanced, highly efficient technologies of production of meat, milk and other farm products and on the development of highly productive, new livestock and poultry breeds. The efficiency of pedigree work must be increased, industrial cross breeding must be improved and the method and technique of artificial insemination of animals must be refined.

Improvement in the organization of the veterinary-sanitary service and development of effective agents for the control of animal diseases must be the objects of constant concern.

It is necessary to intensify investigations on the production of feed protein and various vitamin additives and on the processing of food and industrial waste. Right now there is an urgent need to develop and extensively introduce an automated system of management of all production and to apply the most modern systems of recording and reporting at animal husbandry complexes, poultry farms and sections. The efforts of scientists, specialists and party, Soviet and economic managers must be directed toward the accomplishment of this important task.

Ensuring the growth of production of meat, milk, eggs and other livestock products and raising labor productivity are not only the tasks of agricultural workers. All the enterprises and organizations forming part of the republic's agroindustrial complex must make their contribution to this important matter. They should consider the advance of animal husbandry a top-priority task.

Implementation of measures for the advance of labor productivity in animal husbandry will promote an increase in the production of farm products, a reduction of material and labor expenditures on their output and the transformation of this branch into a highly profitable sector of agriculture.

11,439
CSO: 1824/556

LIVESTOCK

ECONOMIC FACTORS AFFECTING MILK PRODUCTION EFFICIENCY

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 83 pp 44-50

[Article by Nurambik Giniyatovich Araslanov, head of the Department of Political Economy of the Bashkir Agricultural Institute: "Economic Principles and Factors in Increase in Efficiency of Dairy Farming"]

[Text] A successful fulfillment of the tasks concerning the further development of agriculture set by the 26th party congress and the USSR Food Program for the period until 1990 is closely connected with an efficient management of all animal husbandry sectors and with an increase and reduction in the cost of milk and meat production.

The USSR Food Program envisages a significant improvement in the structure of the diet of the Soviet people primarily as a result of an increase in the consumption of such products as milk and meat. This is due to the fact that, as is well known, in a person's normal and high-grade diet livestock products account for about one-half of the protein and one-fourth of the calories he needs. In the future (by 1990) the per-capita consumption of milk and dairy products will be increased to 330 or 340 kg as compared with 314 kg in 1980 and of meat, to 70 kg.

To attain these goals, it will be necessary "... to ensure a sharp turn to intensive methods of economic management and to a better utilization of land, production capacities, labor, material and financial resources and all existing potentials and possibilities for an increase in the production of food products. To wage a persistent fight for a rise in labor productivity, economy and thrift, reduction in production costs and elimination of cases of mismanagement and waste" (see "Prodoval'stvennaya programma SSR na period do 1990 goda i mery po yeye realizatsii" /USSR Food Program for the Period Until 1990 and Measures for its Realization/, Moscow, 1982, p 60).

At present on the basis of an acceleration of scientific and technical progress and under the effect of a complex operation of factors different in their force and direction absolute and relative changes in the components of production costs take place on farms. As a consequence of these changes the organic structure of agricultural production and the productivity of live labor rise, which is accompanied by an increase in the volume of output and by a saving of expenditures of combined labor (past and live).

This process also takes place in dairy farming, but under special conditions of reproduction and with a more complex interweaving of many factors, that is, combination of economic and biological processes and interaction and counteraction of economic and biological laws. Here people deal not only with land, the main, according to V. I. Lenin's expression, means of production (see "Poln. sobr. soch." /Complete Works/, Vol 19, p 327), but also with dairy cattle, which appears as a special basic means of production, a machine giving milk (Ibid, Vol 3, p 263). This "live machine" processes feed resources and field cropping waste into the most valuable protein food products and industrial raw materials. Consequently, it is connected with land through fodder and pasture land. Therefore, in dairy cattle breeding, as in cropping, management results depend on the territorial conditions, intermittence of the cycle, seasonal nature and territorial dispersion of production.

All the above-stated has a direct effect on the course of the production process and on the magnitude of the obtained production effect. An increase in the volumes of production of food products up to the scale necessary for the country, which is a complex national economic task, should be considered one of the basic indicators of achievement of the goal of socialist production. Proceeding from this, it is legitimate to state that the level of the population's provision with milk and its processing products of the appropriate assortment and quality, as compared with the scientifically substantiated norms of their consumption, with society's minimal expenses is the general national economic criterion of efficiency of dairy husbandry. The activity of individual labor collectives and animal husbandry workers should be evaluated primarily from this point of view.

In economic practice production results in dairy husbandry are reflected both by physical indicators (gross milk production, number and weight of commercial offspring and the sector's end product) and by value indicators (gross output, that is, milk, offspring and byproducts in terms of value; realized gross and net income of dairy farming) expressing the economic relations between agricultural enterprises and other primary links of the agroindustrial complex, as well as society at large.

When using these indicators for an evaluation of the efficiency of dairy production, we must bear in mind that the physical-material composition of the product is of basic importance from the point of view of general national interests and the value aspect of production, that is, the recovery of expenditures and production profitability, which is determined by the existence of commodity-money relationships under socialism, for farms. Nevertheless, physical indicators serve as the basis for an economic evaluation of the activity of labor collectives of livestock breeders and of dairy farming as a whole, because national interests require an increase in the production of milk, meat and other livestock products even when their production cost rises. However, this does not mean that attention to the complex problems of reduction in production costs can be slackened for a long time.

As is well known, cattle breeding gives more than 50 percent of the gross output of animal husbandry. The country receives more than 90 percent of the beef from cattle of dairy and dairy-meat breeds. For example, on kolkhozes in the Bashkir ASSR milk occupies more than one-third of the gross output and 23 to 25 percent of the sold output.

Implementing the agrarian policy of the CPSU stemming from the decision of the 26th party congress and the July (1978), May and November (1982) Plenums of the CPSU Central Committee, a qualitative leap in the development of dairy cattle breeding and of other sectors of animal husbandry through their transfer to a modern industrial basis is made on a wide front in all the country's regions. A successful solution of these problems requires the uncovering of the potentials for an increase in the production of livestock products and for a decrease in their cost and the demonstration of general and particular (regional) tendencies in the growth of industrial milk production and in the social and economic reorganization of rural areas.

The further increase in the production of dairy products and decrease in their cost is the economic basis for and the main factor in an efficient management of dairy husbandry and the most important direction in the agrarian policy of the CPSU at the present stage.

Significant shifts in the increase in the production of food products, in particular livestock products, have been noted in the country during the last three 5-year periods. Thus, the gross production of milk increased by 43 percent (from an average of 64.7 million tons annually during the 7th Five-Year Plan to 92.7 million tons during the 10th Five-Year Plan) and of meat, from 9.3 to 14.8 million tons (59 percent). At present the Soviet Union is a major producer of milk, animal oil and dairy dietetic products.

During the period following 1965 the per-capita consumption of milk and dairy products (in terms of whole milk) in the country rose 25 percent, reaching 314 kg, and of meat and meat products, 41 percent, increasing to 58 kg. This indicates that the rates of growth of the production of these products outstrip considerably the rates of population growth during the indicated period. At the same time, the growing demand for milk and meat, as well as for their products, is not yet met. Therefore, an increase in the production of the indicated and other high-quality and biologically complete products, which are the basic components in an improved structure of the diet of the Soviet people, is of paramount importance. Proceeding from this, the country's food program envisages the implementation of effective measures for the further development and increase in the efficiency of dairy cattle breeding--the key sector of animal husbandry and the main source of dairy and meat products. Thus, plans are made to increase the average annual gross milk yield to 97 or 99 million tons during the 11th Five-Year Plan and to 104 or 106 million tons during the 12th Five-Year Plan, or to raise it by 12 to 14 percent, as compared with the average production level attained during the 10th Five-Year Plan.

The implementation of this major national economic task, which has complex economic and social aspects, is one of the decisive areas in the realization of the food program. Therefore, the following basic directions in the development of dairy husbandry are put in the forefront: further intensification in the specialization and concentration of production with a transfer to an industrial basis; establishment of a stable and high-grade feed base meeting the needs of intensive dairy production; improvement in pedigree stockbreeding and an accelerated development of a highly productive dairy herd adapted to industrial technology; fullest utilization of the genetic potential for an increase in the productivity of animals and a more efficient utilization of

feed resources, especially succulent and coarse feed. An improvement in the methods and forms of provision of incentives for the sector's workers in the attainment of the best end results and the introduction of new forms of management also play an important place in a successful accomplishment of the above-indicated task.

Extensive experience in the industrial development and efficient management of dairy cattle breeding in many of the country's regions has been accumulated recently. At the same time, an increase in the material intensiveness and production cost of livestock products is now noted on many kolkhozes and sovkhoses, which is due to the effect of a number of objective and subjective extra- and intrafarm factors. This is the result of the fact that the growth of total production expenditures on farms outstrips considerably in its rates the increase in the volume of production of milk and meat and in the sector's gross income. Such an economic process greatly complicates the solution of problems connected with a rise in the recovery of production expenditures and capital investments and with the implementation of a stable expanded reproduction at kolkhozes, sovkhoses and interfarm associations. Hence the urgent task of searching for more efficient, new methods and ways of increasing labor productivity and the efficiency of utilization of the ever rising technical and production potential at every section and at every cattle breeding complex and farm.

An analysis of the dynamics of the level and structure of expenditures per unit of output makes it possible to uncover internal potentials and to map out measures to increase and reduce the cost of output.

From the cited data characterizing the changes in the level and structure of the production cost of milk under the conditions of transfer of dairy farming to an industrial basis it can be seen that the share of material expenditures in total expenditures increases continuously and the wage fund decreases (table 1). At the same time, the production volume increases and labor productivity grows, but production cost rises. Thus, during the analyzed period the production cost per ton of milk rose 62.6 percent on the country's kolkhozes and 57.9 percent in Bashkiria, while the share of wage expenditures decreased by 11 and 10.4 percent respectively and the share of material expenditures grew. In both cases the recovery of expenditures in dairy farming declined by more than 100 percent, that is, the sector became unprofitable, despite the repeated increase in the purchase prices of milk.

The increase in the production cost of the products of cattle breeding and of other agricultural sectors is due in large measure to many intrafarm factors. However, the results of this analysis show that the increase in the cost of milk production was due mainly to the outstripping growth of the outlays on feed and of other direct expenditures, as compared with the increase in gross milk yield. Thus, whereas in 1970 the indicated items of expenditures in the production cost per ton of milk totaled 97.9 rubles, in 1980 they totaled 196.2 rubles and on Bashkiria's kolkhozes, 96.9 and 184.8 rubles respectively, that is, more than doubled, comprising about two-thirds of all the production expenditures. Feed occupies 38 to 42 percent of the production cost of cattle breeding and plays a decisive role in the formation of the level and structure of production expenses in the sector.

Table 1. Level and Structure of Expenditures in Dairy Cattle Breeding

(1) Год	Производственные затраты		(3) В том числе				Материаль- ность (4) производства 1 т молока, руб.
			(5) на оплату труда		(6) материальные затраты		
	(2) всего, млн руб	на 1 т, руб	(8) млн руб	(9) %	млн руб	(9) %	
(7)			В колхозах СССР (10)				
1970	5 622	176,6	2890,3	51,4	2731,7	48,6	91,8
1974	7 760	201,9	3632,2	46,8	4127,8	53,2	117,9
1975	8 363	217,2	3789,6	45,3	4573,4	54,7	130,7
1979	10 528	267,8	4347,2	41,3	6180,2	58,7	172,2
1980	10 920	287,1	4408,4	40,4	6511,0	59,6	187,6
1980 г. в % к							
(11) 1970 г.	194,2	162,6	152,5	-11	238,3	+11	204,3
			(12) В колхозах Башкирской АССР				
1970	107,0	174,2	55,1	51,5	51,9	48,5	90,8
1980	233,6	275,1	95,8	41,1	137,8	58,9	179,1
1980 г. в % к							
(11) 1970 г.	218,3	157,9	173,9	-10,4	265,5	+10,4	197,0

Key:

- | | |
|--|---|
| 1. Year | 7. Total, million rubles |
| 2. Production expenditures | 8. Per ton, rubles |
| 3. Including | 9. Million rubles |
| 4. Material intensiveness of pro-
duction per ton of milk, rubles | 10. On USSR kolkhozes |
| 5. On wages | 11. 1980 in percent of 1970 |
| 6. Material expenditures | 12. On kolkhozes of the Bashkir
ASSR |

The big feed expenditures per quintal of milk and meat are due to the high production cost of the combined feed unit and to the substantial overexpenditure of feed per unit of output owing to the shortage of protein and other substances in it and the systematic underfeeding of animals.

These factors bring about the low level of recovery (conversion) of feed and hamper an increase in the volume of production and a decrease in the production cost of milk. For example, the production cost per quintal of feed units of the feed fed to animals on the country's kolkhozes rose from 5.9 to 8.7 rubles (47.5 percent) and its consumption per quintal of milk increased from 1.48 to 1.53 quintals of feed units (by 3.4 percent) instead of the 1.1 to 1.2 according to the norm.

The results of the combination grouping of kolkhozes in the southern forest-steppe of the Bashkir ASSR point to the degree of effect of the indicated factors on an increase and decrease in the cost of milk production and to the tendencies in the change of the sector's production and economic indicators (table 2).

Table 2. Dependence of Resultative Indicators of Dairy Cattle Breeding on the Level of Feed Utilization

(1) Группы колхозов по себестоимости I и корм. ед., руб.	(2) Подгруппы по затратам кормов на I и молодня, корм. ед.	(3) Число под-колхозов	(4) Себе-стоимость I и корм. ед., руб.	(5) Затраты кормов на I и молодня, корм. ед.	(6) Себе-стоимость I и молодня, руб.	(7) В том числе расходы на корма		(8) Окупае-мость затрат, %
						руб.	%	
I. До 5,50 (10)	(10) До 1,30	15	4,74	1,18	20,56	5,60	27,2	110,9
	1,31—1,60	30	4,41	1,43	21,08	6,31	29,9	105,7
	(11) Свыше 1,60	36	3,38	1,86	23,02	8,14	35,3	90,0
	В среднем по I группе (12)	81	4,45	1,54	21,74	6,89	31,7	100,0
II. 5,51—8,00	(10) До 1,30	23	5,97	1,28	23,10	7,69	33,3	99,3
	1,31—1,60	37	6,45	1,42	24,58	9,22	37,5	92,8
	(11) Свыше 1,60	19	6,57	1,79	27,94	11,80	42,2	81,1
	В среднем по II группе (13)	79	6,32	1,57	24,89	9,34	37,6	91,4
III. Свыше 8,00 (11)	До 1,30	7	8,39	1,01	24,25	10,13	41,7	78,3
	1,31—1,60	6	8,53	1,36	28,81	11,61	40,3	79,6
	(11) Свыше 1,60	11	9,10	1,64	28,97	13,97	48,2	80,0
	В среднем по III группе (14)	24	9,17	1,34	27,57	12,31	44,6	79,9

Key:

1. Groups of kolkhozes according to the production cost per quintal of feed units, rubles
2. Subgroups according to feed expenditures per quintal of milk, feed units
3. Number of kolkhozes
4. Production cost per quintal of feed units, rubles
5. Feed expenditures per quintal of milk, feed units
6. Production cost per quintal of milk, rubles
7. Including outlays on feed
8. Recovery of expenditures
9. Rubles
10. Up to
11. Over
12. On the average in group I
13. On the average in group II
14. On the average in group III

Both in the groups and subgroups of farms, as the production cost of feed and its expenditures per unit of output rise, there is a decline in the output of milk per 100 rubles of expenditures (of 21 percent), especially material expenditures (of 31.2 percent). From the increase in the production cost per feed unit the expenditures per quintal of milk grow from 21.7 to 27.6 rubles, that is, by 28 percent and from the increase in the consumption of feed, by 12 to 27 percent. A combined effect of these factors brings about an increase in the production cost per quintal of milk ranging from 20.6 to 29 rubles, that is, of 41 percent. At the same time, the expenditures on feed increase 2.5-fold—from 5.6 to 14 rubles. The effect of other factors is not taken

into account in this case. These factors also have approximately the same effect on the recovery of expenditures in dairy farming. Therefore, feed is the limiting link in an efficient management of dairy farming, as well as of other animal husbandry sectors. Consequently, when there is a shortage of feed, all the other production factors cannot give the desired effect.

The results of the grouping of farms indicate that on kolkhozes in the southern forest-steppe, when the production cost per quintal of feed units is within 4.4 to 4.5 rubles and feed expenditures per quintal of output are no more than 1.5 feed units, dairy production becomes profitable. This conclusion is of practical importance for many farms during the development and implementation of measures for a reduction in the production cost of feed and its efficient utilization.

In order to show the effect of an efficient utilization of feed and its production cost on the indicators of efficiency of dairy cattle breeding, we performed variant calculations (tables 3 and 4).

Table 3. Effect of the Level of Combined Production Cost of Feed Rations on the Efficiency of Milk Production on Kolkhozes in the Bashkir ASSR

	1980	Variant			
		II	III	IV	V
Production cost per quintal of feed units, rubles	6.80	6.00	5.00	4.00	3.00
Feed consumption per quintal of milk, quintals of feed units	1.49	1.49	1.49	1.49	1.49
Feed expenditures per quintal of milk, rubles	10.13	8.94	7.45	5.96	4.47
Production cost per quintal of milk, rubles	27.5	26.3	24.8	23.3	21.8
Average sales price per quintal of milk, rubles	25.9	25.9	25.9	25.9	25.9
Recovery of expenditures, %	94.2	98.4	104.4	111.0	118.6

Table 4. Effect of Specific Feed Expenditures on the Efficiency of Milk Production on Kolkhozes in the Bashkir ASSR

	1980	Variant			
		II	III	IV	V
Production cost per quintal of feed units, rubles	6.8	6.8	6.8	6.8	6.8
Feed consumption per quintal of milk, quintals of feed units	1.49	1.4	1.3	1.2	1.1
Feed expenditures per quintal of milk, rubles	10.13	9.52	8.84	8.16	7.48
Production cost per quintal of milk, rubles	27.5	26.9	26.7	25.5	24.9
Average sales price per quintal of milk, rubles	25.9	25.9	25.9	25.9	25.9
Recovery of expenditures, %	94.2	96.3	97.0	101.4	104.2

All things being equal the recovery of expenditures in dairy farming will exceed 100 percent if the production cost per quintal of feed units of the annual ration of the dairy herd is lowered to 5 rubles (by 26.5 percent). The same results can be attained when the actual specific feed expenditures per quintal of milk are reduced to 1.1 feed units (by 26 percent). Higher indicators of efficiency of dairy production are attained with a simultaneous implementation of measures for a decrease in the production cost and an efficient utilization of feed, as well as improvement in its quality. For example, reducing the production cost per quintal of feed units of the annual ration of the dairy herd from 6.8 to 3 rubles, or 2.3-fold, and specific feed expenditures per quintal of milk from 1.49 to 1.1 quintals of feed units (1.4-fold) makes it possible to lower the production cost of milk by 30.2 percent. At the same time, the profitability of dairy farming on the republic's kolkhoses will rise to 30 or 35 percent and, with due regard for the new purchase prices of milk established as of 1 January 1983, will increase even more.

The practice of advanced farms in Bashkiria points to the practical possibilities of attaining calculated specific feed expenditures per quintal of milk and of lowering the production cost per quintal of feed units according to the variants presented above. For example, in 1980 a total of 1.18 quintals of feed units per quintal of milk were expended on the Kolkhoz imeni K. Marx in Dyurtyulinskiy Rayon (variant IV), 1.26, on the Leninskiy Oktyabr' Kolkhoz in Birskey Rayon and on the Kolkhoz imeni 50-Letiya SSR in Meleuzovskiy Rayon (variant III) and 1.36, on the Kolkhoz imeni Salavat in Sterlitamakskiy Rayon (variant II). On these farms the average annual milk yield per cow totals from 2,750 to 3,582 kg, the production cost per quintal ranging from 22.2 to 23.3 rubles. For many years dairy husbandry has been a profitable production sector.

The indicated kolkhoses annually obtain high harvests of fodder crops, on the average, reaching 3,000 to 4,000 feed units per hectare, while the production cost per quintal is no more than 4 to 5 rubles (variants IV-V). Farms grow corn for silage and green fodder, other silage crops, fodder root crops and perennial grass primarily on irrigated areas. Two or three grass harvests (1,000 to 1,500 feed units per hectare) are obtained on plots where mineral and organic fertilizers are applied and repeated irrigation is carried out.

A regular feeding of animals during the winter stable and pasture period through the establishment of carry-over insurance feed reserves in a volume of no less than 25 to 30 percent of the annual need and its prompt delivery to places of consumption is of great importance for an increase in feed resources. Bashkiria's advanced farms, to avoid superfluous transport expenditures and feed losses reaching 25 to 30 percent, transport and store the bulk of coarse and other feed in feed yards and feed storage facilities before the beginning of the great snow fall, using transport facilities, including the entire cart transport, free from fall field operations.

The rates of development and increase in the efficiency of dairy husbandry, as well as of other feed consuming sectors, are determined by the state of the fodder base. In order to fulfill the food program successfully, farms must increase feed production approximately 1.5-fold as compared with the

level attained by the end of the 10th Five-Year Plan. It will be necessary to accelerate the development of the feed industry, to lend a specialized sectorial nature to fodder production on kolkhozes and sovkhozes and to implement a set of measures for its further intensification.

When good premises and structures with overall electromechanization and a highly productive dairy herd are available on farms, the formation of a reliable, high-quality and efficient feed base and its constant improvement are the most important and effective levers of increase in production and economic indicators and some of the characteristic features of the industrial development of dairy production. With due regard for the biological features of dairy cattle on all farms it is advisable to maximally utilize coarse, succulent and other cheaper feed through the introduction of advanced methods of cultivation of fodder crops and the procurement, transportation and preparation of feed for feeding.

The aim of the party and the government is to see to it that the big material and financial resources assigned to the agroindustrial complex give a return during the shortest possible period and provide a full-weight increase in high-quality food products for our society. In his speech at the November (1982) Plenum of the CPSU Central Committee Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, especially stressed that the fulfillment of the food program must not be delayed. The workers of the agroindustrial complex must increase their efforts from day to day and work so that the vast funds allocated for the accomplishment of this task give a return today and an even bigger one tomorrow.

The shortcomings and oversights in the provision of incentives for the labor of livestock breeders and in the creation of the conditions of work and rest necessary for them are some of the restrictive factors in a successful accomplishment of these tasks and in a more rapid development and increase in the efficiency of dairy production. The results of the grouping of the republic's kolkhozes indicate that, when the labor productivity of kolkhoz members of group VII triples, as compared with group I, the payment per man-day increases 2.4-fold (from 3.3 to 7.8 rubles). At the same time, however, the share of livestock output in the total volume of the gross output of farms is lowered from 51 percent in farm group I to 33 percent in group VII, or by 18 points, that is, the lower the production of milk, meat and other livestock products, as compared with plant products, on a kolkhoz, the comparatively higher the wages of kolkhoz members.

On kolkhozes in the Bashkir ASSR in 1965-1980 the payment per man-day for milkmaids and mechanical milking operators rose only 2.2-fold and for herds-men doubled, reaching 4.8 and 4.3 rubles, as compared with 6 rubles for machine operators employed in plant growing. Consequently, with due regard for the level of payment and working conditions material incentives for cattle breeding workers are lower than for tractor and machine operators and drivers.

A constant improvement in the wage system and intensification of material incentives for workers are especially important in dairy farming and other sectors of intensive animal husbandry, where a great deal of industry, high

responsibility for the entrusted area of work, discipline, economy, thrift and efficient organization of labor and production management are required from the performer of labor operations. These qualities must be developed in all animal husbandry workers.

In the interest of a more efficient management of dairy farming and other animal husbandry sectors the CPSU Central Committee, the USSR Council of Ministers and the AUCCTU adopted the decree "On Additional Measures To Retain Workers Employed in Animal Husbandry at Kolkhozes, Sovkhozes and Other Agricultural Enterprises." In this connection the experience, methods and forms of provision of incentives for labor collectives accumulated on advanced cattle breeding farms in the Bashkir ASSR deserve a careful study and extensive popularization. In our opinion, of interest is the experience of the Leninskiy Oktyabr' Kolkhoz in Birskiy Rayon, which has made big advances in the development of industrial cattle breeding and in the strengthening of the farm economy. A set of social and economic measures for a rise in the living standard of rural workers, improvement in housing and domestic conditions, creation of communal conveniences, public services and amenities for settlements, planned change in the social and skill structure of the collective, satisfaction of its needs and spiritual and physical development of kolkhoz members and members of their families has been implemented here for many years.

These measures contributed to the fact that on the kolkhoz the gross production of milk increased from 736 tons in 1974 to 1,907 tons in 1980 (2.6-fold), including of commodity milk, 2.8-fold, while the marketability of dairy farming grew from 80.3 to 85.6 percent. In 1980 from the sale of milk the farm obtained 46,200 rubles of profit and from cattle breeding as a whole, more than 72,000 rubles, or 42 percent of the total amount of profit on the kolkhoz. During those years the payment per man-day increased from 4.55 to 5.85 rubles (1.3-fold).

The labor code of kolkhoz members adopted on the farm plays an important role. This code attaches great importance to an increase in the responsibility of every kolkhoz member and specialist for the general results of work of the collective of production subdivisions and the entire farm, to the retention of personnel in rural areas, to the educational role of the collective and to the establishment of exemplary discipline. A high standard of production and a high level of consciousness on the part of everyone are integral parts of this code.

A systematic transformation of the entire rural way of life is of great importance in the further strengthening of the farm economy. Taking this into consideration, on the kolkhoz settlements, where the main production sections are concentrated, are expanded and provided with public services and amenities at accelerated rates. Thus, a dairy complex for 850 cows, a pelletized feed plant, a machine yard, a garage, a machine shop and other big modern facilities and structures, which give an industrial appearance to the rural area, have already been built and operate successfully at the farm's central homestead. Furthermore, the Cultural Center of the kolkhoz for 350 seats, a secondary boarding school for 320 students, a trade center--a two-story building with a restaurant for 75 seats--a children's combine, a bath house, a laundry, urban-type dwellings of a total area of about 7,000 square meters with well-arranged apartments with all conveniences (water supply, central heating, gas and so forth) have been commissioned.

The successful layout of two-story homes (a kitchen, a dining room and a bathroom on the first floor and habitable rooms on the second floor) and the location of the structures and premises necessary for the livestock and poultry of kolkhoz members and of garden plots near them made it possible to combine the conditions of urban life with the advantages of rural settlements. In the rural area roads were asphalted and greenery was planted near them, a water pipe about 3 km long for intrafarm purposes was built, a park was laid out on 9 hectares and so forth. Furthermore, highways connecting settlements and production subdivisions with themselves and with the farm's central homestead were built, which produced a significant economic and social effect.

This kolkhoz and other advanced farms in the republic exemplify how a rural locality, its housing blocks and the enterprises for the production of milk, meat and other products on an industrial basis, farm subdivisions for rendering production services and cultural-educational and other institutions located here gradually begin to assume an appearance in which the significant differences in the urban and rural way of life are obliterated. At the same time, the nature, content and attractiveness of agricultural labor change. The sphere of production and cultural-general services develops, which contributes to an increase in the labor participation of kolkhoz members in public production and to the retention of young personnel in rural areas.

Thus, a stable development of dairy cattle breeding and of other production sectors on kolkhozes and sovkhoses is closely connected with the creation of specific economic and social living conditions in rural areas. An overall approach to the accomplishment of these tasks will make it possible to strengthen the economy of farms, to fulfill the plans for the sale of milk, meat, grain and other products to the state and to constantly raise the labor productivity and well-being of agricultural workers, which will contribute to the implementation of the decisions of the May and November (1982) Plenums of the CPSU Central Committee and to the realization of the food program.

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LIVESTOCK

ESTONIAN MEAT, MILK PROCUREMENT DATA REFLECT GAINS

Tallinn SOVETSKAYA ESTONIYA in Russian 16 Sep 83 p 1

[Article: "Responsibility of a High Reward"]

[Excerpt] The successful course of feed procurements obtained from grass has been discussed on more than one occasion both orally and in writing. There is one disturbing fact however; some farms have already commenced feeding their winter supplies to the livestock. The September rainfall is certainly accelerating growth in the aftercrop and thus the procurement of feed, especially silage, must be continued in all areas. By the beginning of September, almost two dozen farms had still not fulfilled their plans for procuring feed from grasses.

Unharvested straw can be seen on many fields in almost all of the rayons and this is inhibiting the cultivation of the soil. And indeed straw is a valuable feed and one which must be supplied to the livestock in large quantities at the present time.

The agricultural workers are grateful to those city workers, pupils and students who are making a considerable contribution towards harvesting the crops and procuring the feed. At the present time, potatoes, vegetables and root crops require many working hands and transport equipment. This is why the relationships between the kolkhozes and sovkhoses on the one hand and the enterprises, institutes, patrons and schools on the other must become more intimate and efficient during the coming weeks.

It is gratifying to note that, notwithstanding the tense work being performed out on the fields, successes have been achieved in animal husbandry in recent months. In August, an average of 342 kilograms of milk was obtained per cow and this figure is 7 kilograms higher than the August indicator for last year. The milk yields have increased in all regions with the exception of Khiumasskiy, Kokhtla-Yarvaskiy, Pylvaskiy, Rakvereskiy and Tartuskiy Rayons. Moreover, the reduction in Kokhtla-Yarveskiy Rayon amounted to 13 kilograms and in Khiumasskiy Rayon -- 10 kilograms. On the other hand, the productivity of the dairy herd on farms in Khar'yuskiy Rayon increased by 19 kilograms, in Raplaskiy Rayon -- by 18 and in Paydeskiy Rayon -- by 15 kilograms.

By 1 September, the milk yield per cow at kolkhozes and goskhozes since the beginning of the year was 2,636 kilograms -- or 303 more kilograms than by this

same time last year. The milk yields increased in all of the rayons and particularly in Khar'yuskiy -- by 388 and Paydeskiy Rayons -- by 393 kilograms. Paydeskiy Rayon this year possesses all of the prerequisites required for obtaining a rayon average of 4,000 kilograms of milk per cow. The livestock breeders in Rakvereskiy Rayon possess similar potential.

**Meat Purchases and Average Daily Weight Increases in Livestock
During Fattening (January to August 1983)**

Rayons	Livestock and Poultry Purchased At All Categories of Farms, in % of		Average Weight of Livestock Purchased		Average Daily Weight Increase in Livestock During Fattening at Kolkhozes and Sovkhozes, in grams	
	Annual Plan	Corresponding Period For 1982	Cattle	Hogs	Cattle	Hogs
Khar'yuskiy	72	125	441	98	637	448
Rakvereskiy	69	140	456	106	650	443
Vyruskiy	67	134	414	110	600	438
Valgaskiy	66	142	411	104	595	410
Paydeskiy	66	155	456	105	633	481
Raplaskiy	64	147	441	101	719	456
Pylvaskiy	64	121	431	104	610	429
Yygevaskiy	63	129	430	107	573	442
Khaapsaluskiy	63	141	419	100	652	443
Vilyandiskiy	63	132	433	110	642	505
Tartuskiy	62	131	416	107	540	428
Pyarnuskiy	61	119	427	104	579	507
Khiyumaaskiy	59	104	428	107	615	494
Kingiseppskiy	59	112	389	97	608	461
Kokhtla-Yarveskiy	58	127	419	104	576	436

As a rule, the milk yield level determines the level of organizational work carried out on a farm. In August, when the farm leaders and specialists were concentrating their principal attention on harvesting the crops, less concern was displayed for the dairy herd and this in many instances brought about a greater reduction in the milk yields than expected. Certainly, a number of objective factors could be found at a number of farms. Nevertheless, opportunities and reserves for correcting the situation can certainly be found at all of the farms. However, elementary mistakes are being tolerated in the organization of production and in managing the farms and proper discipline is not being maintained. In such instances the RAPO's /rayon agroindustrial association/ must require the production leaders and specialists to establish the proper order.

During the 8 month period, 17 percent more milk was sold to the state than was sold during the same period 1 year ago. The annual plan for the sale of milk

was fulfilled by 75 percent. Milk production and procurements increased in all of the rayons and especially in Khaapsaluskiy, Kingiseppski and Khyumaaskiy Rayons. The fulfillment of the state plan for milk sales is a realistic possibility in all areas this year.

**Milk Purchases and Cow Productivity
(January to August 1983)**

Rayons	Milk Purchased At All Categories of Farms, in % of:		Average Milk Yield Per Cow at Kolkhozes and Sovkhozes, in kg	± kg Compared To Corresponding Period For 1982
	Annual Plan	Corresponding Period for 1982		
Khaapsaluskiy	83	124	2506	-357
Kingiseppski	80	116	2414	-258
Khyumaaskiy	79	119	2517	-277
Pyarnuskiy	78	116	2768	-289
Raplaskiy	76	128	2665	-456
Rakvereskiy	76	117	2851	-314
Kharyuskiy	76	123	2597	-388
Paydeskiy	75	123	2861	-393
Vilyandiskiy	75	119	2717	-371
Valgaskiy	73	109	2283	-211
Vyruskiy	73	111	2514	-185
Yygevaskiy	73	114	2647	-255
Tartuskiy	72	115	2494	-242
Pylvaskiy	72	106	2586	-108
Kokhtla-Yarveskiy	72	114	2519	-264

The transitional period of autumn is approaching. During previous years it has been accompanied by a sharp drop in milk yields. Thus, during September of last year the kolkhozes and sovkhozes on the average obtained 47 less kilograms of milk than they did in August and in October -- 24 kilograms less than in September. Although a certain reduction in the milk yield level, owing to a sharp change in the maintenance and feeding conditions for the herd, can be considered normal, the reduction that has taken place in recent years has been too sharp. And this is explained by poor organization for the feeding operations during the transitional period. This year every attempt must be made to ensure that the animals are supplied with the required quantities of feed and strictly in accordance with the established schedules.

The last period for preparing the livestock facilities for winter is at hand. The cold weather must not take the farms by surprise. Interruptions can occur in the supply of electric power and thus the appropriate units and reserve generators must be prepared in the proper manner.

This year the production of meat and the sale of livestock to the state have proceeded better in August than was the case 1 year ago. Twenty one percent more livestock and poultry were sold and since the beginning of the year -- 32 percent. The annual task for the 8 months was fulfilled by 65 percent. The production and sale of meat in Paydeskiy, Rakvereskiy, Valgaskiy and Vyruskiy Rayons have been organized better than in other rayons. Compared to last year, all of the rayons have recorded increases in their sales of livestock and poultry.

This year the average daily weight increases in livestock undergoing fattening regimes are rather high. In the case of cattle, they have amounted to an average of 602 grams over the 8 month period compared to 496 1 year ago and for hogs -- 455 grams compared to 404. The average weight for cattle at the meat combines was 430 kilograms (1 year ago -- 403), hogs -- 105 kilograms and in August -- 106 kilograms compared to last year's figure of 81.

All of the rayons are capable of fulfilling their tasks for the sale of livestock and poultry; these tasks must be fulfilled by each kolkhoz and sovkhov. This requires first of all an intensification in the fattening of cattle and increases in the daily weight gains. At the present time, the tops of vegetables and root crops are to be found in all areas and a certain amount of feed is provided by potatoes. Full use must be made of these opportunities.

As yet, very little concern is being displayed for the fulfillment of next year's meat production plan. This is partially explained by the fact that this year 6 percent fewer of the principal and replacement sows are being mated than was the case 1 year ago. The situation in this regard is especially poor on many farms in Pylvaskiy, Valgaskiy and Vyruskiy Rayons. An intensification of fattening operations alone will not be sufficient for fulfilling next year's tasks; an optimum number of animals is also required.

The production of eggs and their sale to the state are proceeding in a successful manner this year. One hundred and fifty nine eggs have been obtained from each laying hen during the 8 month period, or 11 more than last year. Four percent more eggs were produced and sold to the state than was the case for the same 8 months of last year. The annual plan was fulfilled by 70 percent.

The autumn weather is making its presence known and this means that all of the crops grown with such difficulty must be sheltered in a reliable manner in the granaries and storehouses. The fulfillment of the obligations associated with the sale of vegetables, potatoes and other field crop husbandry crops to the state must be accelerated. The ESSR Agroprom, the republic's Minplodoovoshchkhov, procurement organizations and the kolkhozes and goskhozes must undertake efficient measures aimed at ensuring that these obligations are fulfilled in a timely manner. The population, particularly that portion of it which has conditions at its disposal for the storage of potatoes and vegetables, must participate in a considerably more active manner in the creation of such winter supplies.

As is known, our republic has been acknowledged as one of the winners of the socialist competition for the country's livestock breeders for increasing the

production of animal husbandry products during the 1982/83 winter. The diploma of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee obligates our agricultural workers to perform even better and to support the appeal made by those who participated in the meeting of the party, soviet, professional trade union and komsomol aktiv and the representatives of economic organizations to join actively in the socialist competition for increasing the production and procurements of animal husbandry products during the 1983-84 winter period.

7026

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PROGRESS, PROBLEMS IN INTRODUCTION OF MODERN HOGBREEDING METHODS

Moscow SVINOVODSTVO in Russian No 8, Aug 83 pp 16-18

[Article by N. Kozlo, deputy general director of VNPO for Breeding Work in Animals] Husbandry: "A Progressive Method for Farms on the Reproduction of Hogs"]

[Text] The work carried out by many kolkhozes and sovkhozes has shown that the yield obtained from young stock can be relatively high when the farm specialists and leaders display proper concern for those problems associated with the reproduction of hogs and for the daily and laborious work performed by farm livestock breeders in the timely carrying out of insemination and farrowing operations.

Over a period of many years, the farms in the Lithuanian SSR have obtained more than 2,000 young pigs for every 100 sows. The Latvian and Estonian SSR's -- 1,800 or more young pigs.

At the Sovkhoz imeni Kalinin in Artemovskiy Rayon in Donetsk Oblast the yield of young pigs per 100 sows has in recent years been 2,500 or more. In 1982 this indicator increased to 2,600 head. At the Sovkhoz imeni Litvinov in Slavyanoserbskiy Rayon in Voroshilovgrad Oblast -- 2,410 young pigs for every 100 sows. In addition to satisfying their own requirements for animals, this also enabled the farms to sell a considerable number of them to other farms and to the population.

At the same time, there are many unresolved problems associated with the management of hogbreeding operations. The level of selection-breeding work on many farms is still not in keeping with the tasks assigned for introducing the achievements of scientific-technical progress into hogbreeding operations. In a number of republics, krays and oblasts, proper attention is not being given to strengthening and expanding the network of breeding farms, to the introduction of progressive technologies or to artificial insemination. All of this can only adversely affect the implementation of measures aimed at increasing considerably the yield of young pigs and achieving radical improvements in the organization of selection-breeding work.

Artificial insemination is one of the most effective means for bringing about rapid qualitative improvements in hogs and it possesses great zootechnical and economic advantages over natural mating.

Experience has shown that artificial insemination in hogbreeding makes it possible, with minimal expenditures, to utilize the best boar-sires in an intensive manner, to reduce their number by a factor of no less than 10 and to use large-size boars which because of their heavy weight cannot be employed in natural mating.

This method makes it possible to lower considerably the cost of fruitful insemination of sows and to obtain offspring by increasing the contribution made by a boar by a factor of 15-20. It ensures observance of the veterinary-sanitary requirements during mating of the animals and it provides an evaluation of the quality of the ejaculators and their disinfection and this in turn makes it possible to prevent the transmission of diseases of the sexual organs. In addition, it eliminates sperm having a low fertility rate and it raises the results of insemination.

The zootechnical value of artificial insemination lies mainly in the fact that it makes it possible to raise by many times the effectiveness of the selection procedure and to direct the changeability by moving it in the desired direction with each generation, thus creating opportunities for further improvements in the herd.

Taking into account the great economic and zootechnical effectiveness of artificial insemination, many local agricultural organs, leading workers and specialists attached to state breeding stations, breeding enterprises, kolkhozes and sovkhoses carried out a considerable amount of work in connection with organizing and increasing the scope of artificial insemination work with sows.

In 1982, at all categories of farms, approximately 2 million sows, or more than one third of the number available at the beginning of the year, were artificially inseminated and their number is increasing with each passing year.

A considerable increase has taken place in the artificial insemination of sows on farms in the Russian Federation, where last year more than 1 million head were inseminated, in the Ukrainian SSR -- more than 500,000, in the Belorussian SSR -- approximately 100,000 and in the Moldavian SSR -- more than 50,000 sows. This work is well organized in Krasnodarsk Kray and in Lipetsk, Rostov, Dnepropetrovsk, Ternopol, Ivano-Frankovsk and other oblasts.

At the present time, there are two forms for organizing artificial insemination at kolkhozes and sovkhoses -- using the sperm of boars maintained directly on the farms (intra-farm station-points) and using sperm supplied to the farms by stations engaged in breeding work and the artificial insemination of agricultural animals (breeding enterprises).

The effectiveness of use of either of these forms for insemination is dependent to a considerable degree upon the manner in which the work is organized, upon personnel training and upon the degree of attention given to the work by the leaders and specialists.

The Poltava station for the artificial insemination of hogs has been performing this work for more than 20 years. Prior to the introduction of artificial insemination, more than 1,500 boars were maintained on farms within the zone

serviced and at the present time this number has been reduced by a factor of more than 10. This has made it possible to realize an average annual savings of 7 rubles per sow. The area thus made available for other use is now being employed for the maintenance of the brood stock and the feed -- for the additional production of pork.

The organization of reproduction work and the artificial insemination of hogs in Ternopol Oblast is deserving of attention. A station has been created here at Mikulinetsy for the specialized insemination of hogs and the maintenance of boar-sires considered to be valuable from a breeding standpoint. The station delivers sperm to all of the farms on a centralized basis.

Last year more than 30,000 sows, or approximately 72 percent of their overall number, were inseminated in the oblast. The fertility rate for the first insemination was 80 percent, with nine offspring being obtained per farrowing. Moreover, the sperm from one boar was used for inseminating an average of 310 sows annually. The expenses for the fruitful insemination of one sow amounted to less than 9 rubles and for a mating -- more than 16 rubles. On the whole, artificial insemination in the oblast during 1982 produced a savings of approximately 150,000 rubles.

Fifteen years ago at the X Let Oktyabrya Sovkhoz in Shchelkovskiy Rayon in Moscow Oblast, a farrowing from natural insemination produced 6.4 young pigs and the cost for one mating was 24 rubles and following the introduction of artificial insemination these figures were 8.8 and 3.6 rubles respectively.

The use of artificial insemination at the Taganrog Sovkhoz in Rostov Oblast made it possible to reduce expenditures for the maintenance of sires to 27,000-30,000 rubles and the expenses for the insemination of sows to 2.56 rubles and this produced an annual savings in excess of 60,000 rubles.

Similar examples are to be found in other oblasts, krays and republics. At the same time, this progressive method for reproduction in hogbreeding is still not being employed extensively in all areas. This work has been carried out to only a weak degree in Kaluga, Smolensk, Orel, Kursk, Bryansk, Zhitomir, Rovno and other oblasts.

It bears mentioning that in a number of oblasts where the artificial insemination of hogs has been organized, shortcomings have surfaced which are adversely affecting the reproduction of hogs. For example, the technology for artificial insemination is by no means being observed in all areas. The Tsarichanka State Breeding Station in Dnepropetrovsk Oblast, despite the requirements set forth in the instructions for the artificial insemination of hogs is using for insemination purposes undiluted sperm without a filler in the amount of 50 milliliters, with a content of 2.5-3 billion sperm. The sperm delivered to farms is stored in cabinets where fluctuations in temperature are permitted.

At the sovkhoses Ostrolenskiy in Nagaybanskiy Rayon and Ural'skiy in Verkhneuralskiy Rayon in Chelyabinsk Oblast, the quality of the sperm is not being checked prior to insemination. This affects the reproduction work. There is a low fertility rate on the farms and the indicator for polycarpic effect in the sows is not very high.

State breeding stations and breeding enterprises play an important role in the organization and carrying out of artificial insemination in hogs. It is possible to cite many state stations and breeding enterprises which not only organize the insemination of sows in their own zone, but often also deliver the sperm of boars to individual rayons, achieving high annual indicators in the process.

Last year the sperm obtained from boars at the Tikhoretsk inter-rayon breeding enterprise in Krasnodarsk Kray was used for inseminating 80,000 sows. More than 300 boars are being maintained here, with the average workload per boar being 400 sows. The fertility rate -- 97 percent, with 1,600 young pigs being obtained from every 100 principal sows. The annual economic effectiveness realized from the use of artificial insemination amounts to more than 300,000 rubles.

Specialists attached to the Boguchar Breeding Enterprise in Voronezh Oblast are carrying out a great amount of work in connection with the introduction of this progressive method for the reproduction of hogs. Over the past year, more than 30,000 sows were artificially inseminated on farms throughout the oblast. Attention is being given at the enterprise to the intensive use of boar-sires. This is being promoted by the strict use of a ration that is balanced in terms of all nutrients.

The farms being serviced here are broken down into four groups, such that the annual rotation brings related lines of a boar back to a farm only once every 5 years. Over the past year the principal sires were used for inseminating an average of 454 sows and the best sires, such as No. 561 TsKB 1679 and No. 26725 TsKB 2191 -- more than 1,000 sows.

It bears mentioning that the workload for boar-sires is increasing annually throughout the country as a whole. Last year the sperm of sires valued on the basis of the quality of their offspring was used for inseminating more than 300 sows. However, this indicator on the whole is still not very high. Whereas in the Estonian SSR the workload for one boar this year is 62 sows, in the Latvian and Lithuanian SSR's -- more than 40, in the Uzbek SSR -- only 5, Turkmen SSR -- 8, Georgian SSR -- 10, Azerbaijan SSR -- 11 and Armenian SSR -- 16 head. In addition to being economically unprofitable, such a low workload for sires is also unjustified from a zootechnical standpoint.

In the Kazakh SSR there are more than 30,000 boars, with the maintenance for each one of them costing 300 rubles annually. It is easy to estimate the savings that would ensue if artificial insemination was introduced on farms in the Kazakh SSR.

The task of the leaders and specialists of agricultural organs, state breeding stations and state breeding enterprises, kolkhozes and sovkhoses consists of searching for production-economic, organizational and scientific forms and methods for improving operations in hogbreeding. One progressive method is that of introducing the use of artificial insemination of animals. This makes it possible to improve reproduction operations in hogbreeding, it raises the yield of offspring and it ensures fulfillment of the tasks of the 26th party congress and implementation of the Food Program.

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7026

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LIVESTOCK

NEW LIVESTOCK RAISING TECHNOLOGY DISCUSSED

Moscow ZHIVOTNOVODSTVO in Russian No 7, Jul 83 pp 2-4

[Article: "Introduce Scientific Achievements in Production on a Broader Scale"]

[Text] The USSR Food Program, which was approved by the May (1982) plenum of the CPSU Central Committee, sets the task of considerably increasing the output of livestock raising production.

In this connection the role of science and introduction of its achievements in production acquire special significance.

During the past several years, the country's scientific research institutions began making a more appreciable contribution to solving important problems in livestock raising. During the years of the 10th Five-Year Plan alone, 7 new highly productive breeds and pedigree groups, 13 types and 83 lines of livestock suitable to conditions of industrial technology were created.

The Animal Husbandry Scientific Research Institute [VIZh], the SibNIPTIZh [not further identified], the Animal Husbandry Scientific Research Institute [NIIZh] of the UkSSR Forest Steppe and Forest Areas, the Estonian Animal Husbandry and Veterinary Scientific Research Institute [NIIZhV], the Uzbek Animals Husbandry Scientific Research Institute [UzNIIZh], the Meteorological Services Scientific Research Institute [VNIIMS] and the Poltava NIIS [not further identified] have developed a scientific basis of milk and meat production technologies and some effective technological solutions suitable to the features of various natural and weather zones of the country.

Currently there are 2,067 milk production complexes operating in the country with a capacity to accommodate 1.8 million head of livestock, 318 beef production complexes with a capacity to accommodate 2.3 million head of livestock and 499 pork production complexes with a capacity to accommodate 9.9 million head of livestock. An analysis of work of these specialized industrial type enterprises, which was conducted by scientific research institutions, shows that as regards intensiveness of production, level of livestock productivity and technical and economic indicators they surpass kolkhozes and sovkhoses. In 1981, the average milk yield per cow in the complexes amounted to 2,524 kg which is 361 kg higher than in kolkhozes and sovkhoses, and the expenditure of fodder per 1 quintal of milk was 7 percent and of labor 37 percent lower.

The flow-shop system of goods production and herd reproduction is prevalent in dairy cattle breeding. More than 8,000 farms with the total number of more than 4.6 million cows have changed over to this system. As a result, livestock productivity increased by 400-700 kg, production costs dropped by 10-12 percent and profitability of the sector increased to 30-35 percent.

The success of work of dairy complexes is linked to a considerable extent with organization of young replacement stock raising. Scientific institutions (the Animal Husbandry Scientific Research Institute, the SibNIPTIZh, the Agricultural Scientific Research Institute [NIISKh] of the TsRNZ [not further identified] and others) have developed and introduced a technology of raising non-calving young cows on specialized farms. It makes it possible to reduce fodder expenditure for breeding by 15-20 percent, increase labor productivity twofold-threifold and obtain primipara heifers with a milk yield of 3,500-4,000 kg per lactation.

To improve dairy livestock in kolkhozes and sovkhoses work is being conducted under the supervision of scientists of the Animal Husbandry Scientific Research Institute, the VNIIRGZh [not further identified], the Latvian Animal Husbandry and Veterinary Scientific Research Institute [LatvNIIZhiv] and other institutes aimed at creating highly productive breeds and types of livestock suitable to industrial production technology for which purpose the best livestock of the Holstein-Friesian, Swiss and Ayrshire breeds are used. More improved breeding methods with the use of electronic computers [EVM] according to the SELEKS [not further identified] program are used in some republics and oblasts. Introduction of breeding achievements has made it possible to increase milk yields on farms in the Estonian SSR to 3,473 kg, in the Lithuanian SSR to 2,911 kg, in the Moldavian SSR to 2,872 kg and in the Leningrad Oblast to 3,204 kg.

Introduction of the technology developed by zootechnical science in raising and fattening cattle has ensured expansion of the scale and raising of the intensity of livestock fattening in kolhozes, sovkhoses and interfarm enterprises. In 1981, complexes fattened and sold to the state 1.8 million head of young stock of an average live mass of 378 kg, which is 54 kg higher of live mass of young stock sold by kolkhozes and sovkhoses. Moreover, expenditure of fodder by complexes was 30 percent lower and labor productivity was fourfold higher.

A more efficient beef production technology with a full production cycle was developed. Twenty-six complexes of this type have obtained and sold to the state 237,000 head of young cattle of live mass of 402 kg and the age of 14-15 months. The average daily increase of live mass totaled 863 g, expenditure of fodder per 1 quintal of increase totaled 650 fodder units and labor expenditures totaled 5.1 hour.

During the past several years, a great influence was exerted on expanding the scale of fattening and raising the livestock mass by introduction of a technology of fattening livestock on plots, which was developed by various scientific institutions (the Animal Husbandry Scientific Research Institute, the Meteorological Services Scientific Research Institute, the AltayNIPTIZh [not further identified] and others) and suitable to zonal features. For example, in Orenburg Oblast more than 200,000 head of livestock are fattened on plots annually and sold at a live mass of 400 kg. This type of fattening is widespread in kolkhozes and sovkhoses in Kazakhstan, Siberia, Uzbekistan and other regions.

A pork flow line production system, which was recommended by scientific research institutes (the Animal Husbandry Scientific Research Institute, the SibNIPTIZh and the Siberian Agricultural Scientific Research Institute [SibNIISKh]), is being introduced and will undoubtedly determine the progress of the sector as a whole.

The average daily increase of live mass of hogs being fattened was 14.5 percent higher in complexes than in all other categories of farms. Labor productivity was 3.6-fold higher, expenditure of fodder per 1 quintal of increase was 33 percent lower and production costs were 26 percent less than in all categories of farms.

In connection with conversion of livestock raising to an industrial basis, the quality requirements for coarse, succulent and concentrated fodder are being raised.

Scientific institutions have developed norms worked out in detail on feeding cattle, hogs and sheep. Their introduction makes it possible to raise the full value in feeding livestock and to reduce fodder expenditure by 8-12 percent.

New fodder preparation and preservation technologies (the Animal Husbandry Scientific Research Institute, VIK [not further identified] and VNIIFBIP [not further identified]) ensure increased preservation of nutrients. Chemical preservation of green fodder reduces the loss of nutrients 2-3 fold, processing coarse fodder with reactants makes it possible to raise their nutritiousness 1.5-2 fold and artificial drying of fodder to increase fodder collection per 1 hectare by 25-30 percent and to completely mechanize fodder distribution processes.

Scientific research institutes have developed mixed feed formulas with a reduced share of concentrates for stall and pasture cow feeding periods, which will make it possible to reduce expenditure of grain by 150-200 kg per 1 t of mixed feed.

A new technology for the output of sheep raising products was proposed and standard designs of dam farms and complexes of various capacity and plots for fattening sheep and raising young stock were developed. This work is being conducted most intensively by the All-Union Order of the Red Banner of Labor Scientific Research Institute of Sheep Raising and Goat Breeding [VNIIOK], the KazNITIO and the SibNIPTIZh.

Poultry raising in the public sector has now been almost completely converted to an industrial basis. The share of farms of the USSR Poultry Raising Industry Administration [Ptitseprom] in the social production of eggs and meat is correspondingly 85 and 82 percent. Major developments in industrial technology of poultry raising were fulfilled by the All-Union Scientific Research and Technological Institute of Poultry Raising [VNITIP], the UkrNIIP [not further identified] and the VNIIFBIP.

Bearing in mind the efficiency of industrial production of animal husbandry products in our country and the shortage of manpower, which will increase in the future, it is necessary to increase the scale of the sector's development on an industrial basis.

Along with construction of new complexes, conversion of livestock raising to an industrial basis is accomplished by modernizing and consolidating existing farms. Developments by the SibNIPTIZh, the NIPTIMESKh of the nonchernozem zone, the Estonian Animal Husbandry and Veterinary Scientific Research Institute [EstNIIZhV] and the AltayNIPTIZh [not further identified] as well as by other institutes are being widely implemented by farms in Siberia, Altai, the Estonian SSR and other zones in the country.

The efficiency of industrial production of animal husbandry products could have been higher if results of scientific research were introduced in production more promptly and broadly. During the past several years, scientists--specialists in zoohygiene--in cooperation with physiologists and technologists have developed some recommendations on providing an optimal microclimate, which ensures high productivity of livestock when it is kept in enclosed premises in various natural and weather zones of the country. Specifically, they recommended new systems of heating and ventilation, the layout of floors, exterior barriers and so forth which yield a noticeable economic effect. However, these developments are being introduced slowly because of a desire to reduce lump sum expenditures on construction. Such illusory saving leads to getting considerably (to 20 and more percent) less of animal husbandry products. Experience proves that expenditures on creating optimal conditions for the upkeep of livestock soon pay for themselves. Moreover, this serves as a basis for preventing livestock diseases, ensuring lasting use of constructed structures and means of mechanization which are destroyed prematurely in an unfavorable environment. A normal microclimate on a farm and in a complex also preserves the health of livestock breeders.

Under conditions of an increasing manpower shortage it is especially important to introduce technological processes in production which will raise labor productivity of maintenance personnel. In this connection demands are increased for creating highly efficient means for mechanizing production processes.

Introduction of promising manufacturing methods in production of animal husbandry products is restrained to a certain degree by imperfection of means for mechanizing production processes. For example, the milk production technology using underground storage of manure considerably reduces expenditure of labor on taking it away. However, it is not properly disseminated owing the shortage of machines and equipment for clearing manure from premises and loading it in means of transportation.

In accordance with the scientific research work program in the 11th Five-Year Plan, a significant scientific potential will be created aimed at raising the output of animal husbandry products. Four breeds, 17 types, 52 lines and 8 crosses of livestock will be introduced and 7 technological processes in the output of animal husbandry products will be developed.

It is planned to create dairy herds with an average milk yield of 5,000 and more kg and with fat content of 3.8-4.2 percent. Development of new methods in preparing and processing fodder, which will raise their digestability, is envisaged.

New systems for feeding and upkeep of meat livestock will be developed, which will make it possible to obtain 1,000-1,300 g in average daily increase of live mass during fattening.

In hog breeding the work will be directed at improving the productive qualities of the livestock and creating new breed groups. It is planned to obtain 750-800 g of average daily increase with 360 fodder units expended per 1 quintal of pork (live weight) from hogs being fattened.

Sheep breeding and poultry raising will be developed further.

Introduction of scientific achievements in practice will make it possible to increase to a considerable degree the production of animal husbandry products and the reduce expenditures of labor. It is known that mass introduction of new technological solutions is implemented through standard projects. Limited introduction of scientific work results on one-two farms, regardless of their scientific value, is more of an information character and cannot be of great national economic significance. It is necessary to implement mass and systematic introduction of new developments in all farms and complexes that are being built or modernized. At the same time, the appraisal of technological solutions that are laid in projects should be improved. Haste and insufficient consideration lead to a drop in production efficiency and brief period of activity of such projects. Some projects are active for only 2-5 years. For example, the standard project 801-315 of a complex, which was regarded as a promising one, was active for a little more than 5 years. Technological institutes of animal husbandry and veterinary science do not bear any responsibility for the quality of projects because they do not participate in developing them and are not their collective coauthors. It would seem that planning organizations are interested in developing highly efficient plans of livestock raising enterprises, and scientific research and technological institutes of animal husbandry in speeding up introduction in production of their own research results through planning. However, until now various links of the science-planning-production system continue to function for the most part in isolation. Each link of the system has its own achievements, but they are not a single whole organizationally and so their potential possibilities are not being used sufficiently.

Technological institutes of animal husbandry in fulfilling actual subjects and in obtaining valuable results very often complete their developments with publications, fragmentary introduction in individual farms and at best by partial use in projects. Compulsory planned joint development of livestock raising complexes by science and planning workers does not exist.

To compensate this shortcoming partially, planning organizations have lately created scientific research subdivisions. These subdivisions repeat the concluding part of work done by technological institutes of animal husbandry by collecting, generalizing, analyzing and synthesizing reports and publications and appraising foreign information and patents.

Afterward the obtained information is translated into technical language (estimates, diagrams, cyclograms and volume-planning solutions), technological solutions are coordinated with the possibility of completing units with means of mechanization, construction components and veterinary and other requirements and project proposals are developed and turned over to planning subdivisions.

However, it is known that publications of technological institutes of animal husbandry and veterinary science, as a rule, are late by 2-3 years after completion of scientific research work. Therefore, the substitution of technological institutes of animal husbandry by planning organizations (mostly of construction direction) cannot be recognized as being normal. Such substitutions, especially under conditions of industrial livestock raising, is lacking in prospects. It must be replaced by a functioning science-planning system.

Solution of this question will make it possible to radically improve introduction of scientific research results in production.

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MODERN STATUS OF AGRICULTURAL SCIENCE: DISCUSSED

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[Article by P.P. Vavilov, academician and president of All-Union Academy of Agricultural Sciences imeni V.I. Lenin: "Agricultural Science During the New Stage"]

[Text] Sixty years have passed since the creation of the Union of Soviet Socialist Republics. During this period of time, our country has become a powerful industrial state with highly mechanized agriculture and advanced science and culture, which are being developed successfully in all national republics of the Soviet Union.

In pre-revolutionary Russia the network of scientific institutes for agriculture was extremely small in number. Such talented scientists as K.A. Timiryazev, P.A. Kostychev, I.A. Stebut and D.N. Pryanishnikov, lacking support, were unable, despite their talent and devotion to science, to exert an appreciable effect on progress in farming and animal husbandry. Twenty five million peasant farms grew low quality wheat, rye, oats, barley and bred low productivity livestock. The grain yields from peasant farms did not exceed 3-8 quintals per hectare.

Based upon the initiative of V.I. Lenin, a decision was handed down in 1918 in the young Soviet republic concerning the creation of a Russian institute of agricultural sciences, but owing to the civil war atmosphere this decision was never carried to fruition. Subsequently, following the restoration and development of a network of experimental stations and the creation of new scientific-research institutes, the USSR Council of People's Commissars adopted a decree in 1929 calling for the organization of an All-Union Academy of Agricultural Sciences imeni V.I. Lenin. Based upon a rich heritage of Russian agricultural thought, the Soviet scientist-agronomists solved a number of the country's large-scale agricultural problems. Under the direction of Academician N.I. Vavilov, the first president of VASKhNIL /All-Union Academy of Agricultural Sciences imeni V.I. Lenin/, new trends were established for field crop husbandry, botany, genetics, plant breeding and other sciences. Over a very brief period of time, the academy's scientists carried out the standardization of crops and varieties for the most important types of plants. A state strain testing network was organized within the VASKhNIL system.

The collective at the All-Union Scientific-Research Institute of Field Crop Husbandry, which now bears the name of N.I. Vavilov, has carried out extensive expeditionary and thorough laboratory studies of cultivate flora in the USSR

and many foreign countries. On this basis a unique gene fund was organized here for the principal agricultural plants, a fund which is constantly being augmented. For the very first time, a service was organized for accounting for and signalling the appearance of pests and diseases.

The academy has become a center for the formation of scientific schools which exert a decisive influence on the entire science of agriculture and its practical work. The scientists carried out large-scale theoretical works and made a number of priority discoveries, especially in field crop husbandry. This includes the discovery by N.I. Vavilov of the law of homologous series of inherited variability, a study on the genetic centers with regard to the origin of cultivated plants, the discovery of amphidiploidy by G.D. Karpechenko and the development of new types of synthesis methods, works by N.V. Tsitsin on remote hybridization and V.A. Rybin and M.A. Rozonov on re-synthesis and genome analysis, the discovery by M.I. Khadzhinov of male sterility in corn and that of V.V. Sakharov and M.Ye. Lobashev concerning the phenomenon of chemical mutagenesis and the creation of the very first tritikals in the world by T.Ye. Meyster and V.Ye. Pisarev.

Under the influence of ideas propounded by K.A. Timiryazev, N.I. Vavilov and I.V. Michurin, a group of talented plant breeders appeared in the USSR. This included V.Ya. Yur'yev, A.A. Saepgin, P.I. Lisitsin, Ya.P. Shekhurdin, P.N. Konstantinov, A.L. Mazlumov, N.V. Rudnitskiy, V.S. Pustovoyt and many others.

The schools of D.N. Pryanishnikov, V.R. Vil'yams, K.K. Gedroyts, N.M. Tulaykov and others laid the foundation for soil science and farming in our country, they validated the need for the use of chemical processes in agriculture and they developed the principal methods for combating droughts and losses in the structure of soils and for protecting soils against erosion and salinization.

VASKhNIL Academician M.F. Ivanov and his disciples made a tremendous contribution towards the transformation of animal husbandry. They organized the scientific breeding of animals for the country as a whole and they bred new strains, types and lines of animals that were suitable for diverse zonal conditions. Academicians K.I. Skryabin, S.N. Vyshel'skiy and their followers ensured the priority of Soviet science in the theory and practice concerned with combating epizootics and helminthosis.

A new science -- farming mechanics -- was founded by Academician V.P. Goryachkin. Under his direction, modern agricultural machines were created which differed basically from everything then available in international practice. VASKhNIL Academician A.N. Kostyakov is quite properly considered to be the creator of our domestic hydrotechnical land reclamation science.

Our Soviet agrarian-economic science has participated actively in the socialist changes which have taken place in the rural areas. It had to solve tasks which had no parallel in international practice. VASKhNIL Academicians V.S. Nemchinov, G.S. Kolesnev and others, relying upon the Leninist theory of socialist cooperation, participated in the solving of many problems associated with organizing large-scale socialist production.

During the post-war years, the agrarian scientists joined in the work concerned with the restoration of agriculture. A system of seed production for

agricultural crops was recreated, the areas of varietal sowings were increased sharply and the selection of plants and animals and breeding work were resumed and expanded.

A new stage in the development of our domestic agricultural science began with the March (1965) Plenum of the CPSU Central Committee. The ideas advanced during the Plenum had a beneficial effect with regard to accelerating studies and implementing their achievements into production operations. During these years the All-Union Academy of Agricultural Sciences imeni V.I. Lenin strengthened its positions considerably. For it was during this period that departments of VASKhNIL were created in all of the large regions of the country and the network of all-union branch and zonal institutes expanded. Within the Academy itself, branch departments were created for the veterinary science, for the protection of plants and for feed production. At the present time, through its branch and regional departments, the Academy is directing 127 institutes, more than 150 experimental stations and other scientific-research subunits. The institutes of VASKhNIL have more than 400 experimental farms.

In carrying out the party's agrarian policies, the VASKhNIL scientists and specialists of the USSR Ministry of Agriculture and ministries associated with the agroindustrial complex completed large-scale scientific works which have been introduced into production operations on an extensive scale. The scientists of VASKhNIL, jointly with specialists of the USSR MSKh /Ministry of Agriculture/, oblast agricultural administrations and experimental stations have scientifically validated zonal systems of farming for all of the country's oblasts, krays and autonomous republics. In Stavropol Kray and in Omsk and other oblasts, which have become pioneers in the mastering of these systems, the culture of farming has been raised considerably within a brief period of time, the expanded reproduction of soil fertility has been achieved and reliable protection is being provided against water and wind erosion. Based upon such a complex of operations, the farmers in these regions are pursuing one chief and overall goal -- high and stable yields for all of the agricultural crops.

A great achievement of the farming science is the theoretical validation, development and introduction of a soil-protective system of farming, which is reliably protecting the soil against wind erosion in the steppe regions of the country. In use on almost 44 million hectares of land, it is producing an annual economic effect in excess of 700 million rubles.

Farming in Kazakhstan serves to confirm the high effectiveness of this complex of soil-protective measures. For all practical purposes, soil erosion has been halted on the fields in this region and farming has become more stable and settled. Whereas prior to the introduction of the elements of this soil-protective system (1961-1965), Kazakhstan produced an average of 14.6 million tons of grain annually, today the gross yields have practically doubled. A considerable increase has taken place in the introduction of soil-protective measures into use in the Volga region, the north Caucasus, especially in Stavropol Kray, in the southern regions of the Ukraine and in other regions of the country. However the complex of measures developed by science for protecting soils against water erosion is being carried out extremely slowly in the various zones throughout the country.

Special importance is being attached to a new trend in the science of agriculture -- contour-land reclamation farming. Thorough studies are required in order to validate the recommendations for the use of sloping lands, which occupy more than 120 million hectares in the USSR.

The Soil Institute imeni V.V. Dokuchayev has composed a state soil map for the entire farming territory of the USSR, including the regions of new development in Siberia and the BAM /Baykal-Amur Trunkline/ zone. This is making it possible to carry out accounting work and to furnish an economic evaluation of the soils and also to uncover reserves for their efficient use. Jointly with geologists, the agricultural chemists made a great creative contribution towards composing a comprehensive chart on a geological-economic evaluation of the resources of agrochemical raw materials in the Soviet Union. The national economic importance of these materials lies in the fact that they reveal not only the supplies of agricultural ore but also the requirements of the republics, krais and oblasts for fertilizers. The scientist-agricultural physicists have created a series of domestic automated artificial climate chambers that is accelerating to a considerable degree the realization of the plant breeding programs. Rapid methods for diagnosing the physical condition and resistance of plants to unfavorable environmental factors and appropriate equipment have been developed. Successful use is being made of simulation models for soil fertility and field productivity in the interest of controlling the water regime during irrigation.

Diverse studies on the biological fixation of nitrogen have led to a technology for producing the preparation rhizotorfin, which in the case of leguminous plants produces an increase of 2-4 quintals of grain per hectare and 6-8 quintals of hay per hectare. The scientists must expand their theoretical, research and applied studies of this problem and commence work on the phosphorus nutrition of plants by controlling the vital activities of specific soil microorganisms.

An intensification of agricultural production is impossible in the absence of the creation and introduction of new and highly productive varieties and hybrids of crops which are adaptable to local conditions and which are capable of utilizing the nutrients found in the fertilizers. Systematic plant breeding and seed production operations are constantly raising the productivity of the varieties and hybrids being created and accelerating their use in production and this has raised the yields considerably and improved the quality of the grain and other field crop husbandry products. Fifty plant breeding centers for field crop husbandry are in operation in the principal natural zones of the country. These centers are staffed with highly skilled personnel and they are equipped with modern laboratory equipment and the means for mechanizing the plant breeding and seed production operations.

Our leading institutes are carrying out a comprehensive study of the international gene fund for cultivated plants and their wild relatives and they are conducting studies on partial and biochemical genetics, intraspecific and remote hybridization, genetically regulated heterosis, experimental polyploidy, mutagenesis, the physiological-genetic principles of productivity and on plant immunity. Use is being made in plant breeding of a culture of cells and tissues, mathematic simulation involving the use of EVM /electronic computer/ and molecular biology and genetic methods. Overall, 723 new varieties were

regionalized during the 10th Five-Year Plan compared to only 564 during the Ninth Five-Year Plan. In 1983 the varietal resources include 214 new varieties and hybrids of agricultural, floral-decorative and medicinal plants.

Notable results were achieved in implementing the special purpose complex scientific-technical programs aimed at increasing the production of grain crops, rice, sugar beets, sunflowers, soybeans, cotton, spinning flax, potatoes, vegetable and other crops. Thus, in 1981, the plant breeding-experimental institutes, during the course of carrying out the special purpose complex scientific-technical program for grain, introduced into production operations 79 new varieties of grain and pulse crops and corn on an area of 5.2 million hectares. The achievements of practical plant breeding are considered to be the property of workers in all of the fraternal republics of the Soviet Union.

The relationships between the All-Union Scientific-Research Institute of Field Crop Husbandry imeni N.I. Vavilov and the country's plant breeding centers have been strengthened. In 1981, this institute transferred more than 120,000 packaged specimens over to the plant breeding-experimental institutes, including 12 donors of rye, 20 donors of tomatoes and 41 sources for grain crop resistance against rust. Based upon the international collection of VIR [All-Union Scientific Research Institute of Plant Growing], 87 varieties of agricultural crops were created and regionalized in 1981. Twelve new varieties, bred by VIR plant breeders, were assigned to production. In 1982, such new corn hybrids as Vostok 2, Kollektivnyy 210 and Kollektivnyy 244 of the Kuban Experimental Station of VIR were regionalized in various republics and zones.

The large achievements realized in the breeding of winter wheat, corn and winter barley are associated with the Krasnodar Scientific-Research Institute of Agriculture imeni P.P. Luk'yanenko. The crossing of remote ecological-geographic forms of wheat in combination with specialized and strict individual selections was developed here on an extensive scale for the very first time. The world renowned masterpiece -- Bezostaya 1 winter wheat -- was created in this manner. A high evaluation was given to such new wheat varieties as Krasnodarskaya 39, Polukarlikovaya 49, Severokubanskaya, Pavlovka, Krasnodarskaya 57 and Prikubanskaya. Each year the institute's varieties occupy more than one third of all of the country's high quality winter wheat sowings. The Kuban plant breeders have developed and introduced into operations highly productive and winter-hardy varieties of winter barley. Nineteen hybrids of corn bred by this institute are being grown on an area of approximately 1 million hectares for grain and on 3 million hectares for silage.

Large scientific schools of the plant breeders F.G. Kirichenko, P.F. Garkavyy and D.A. Dolgushin have been formed at the All-Union Plant Breeding and Genetics Institute. Wonderful varieties of winter wheat and spring and winter barley have been bred here and they are being grown on approximately 10 million hectares. The initial domestic hybrids of sunflowers, created by the institute's plant breeders, have already been regionalized.

The Mironovo Scientific-Research Institute for the Plant Breeding and Seed Production for Wheat, headed by Academician V.N. Remeslo, has provided such

winter wheats as Mironovskaya 808, Mironovskaya Yubileynaya and Il'ichevka, which are being grown in many republics in our country and beyond its borders. The new and highly productive winter wheat varieties Mironovskaya 808 Improved and Mironovskaya 25 were created during the past few years.

The achievements of the Ukrainian Scientific-Research Institute of Field Crop Husbandry, Plant Breeding and Genetics imeni V.Ya. Yur'yev are well known, the varieties of which are being grown on more than 5 million hectares. The first among them is durum spring wheat Khar'kovskaya 46. In the Don River region, deserved recognition has been extended to the winter wheat varieties Severodonskaya, Donskaya Ostistaya, Rostovchanka, Urozhaynaya, Novinka 2, Tarasovskaya 29, all of which were developed at the Zernograd State Plant Breeding Station of the Don Zonal Scientific-Research Institute of Agriculture under the direction of VASKhNIL Academician I.G. Kalinenko.

The collective at the Scientific-Research Institute of Agriculture for the Southeast has provided the soft spring wheat varieties Saratovskaya 29, Saratovskaya 36 and Saratovskaya 42, all of which are unsurpassed throughout the world in terms of drought-hardiness and grain quality. The Bashkir Scientific-Research Institute of Agriculture was the first in international plant breeding operations to breed the Chulpan short-stalk intensive type variety of winter rye. It furnishes 45-60 quintals of grain per hectare and this is a notable indicator for this crop.

The plant breeders at the All-Union Scientific-Research Institute of Rice and the Far East Scientific-Research Institute of Agriculture have created new varieties of rice. The cultivation of this crop using industrial technologies produces 60 quintals of grain per hectare and this has made it possible to eliminate almost entirely the importing of rice. Scientists at the All-Union Scientific-Research Institute of Oil-Bearing Crops, continuing the tradition started by VASKhNIL Academician V.S. Pustovoyt, have bred sunflower varieties having a high oil content. At the All-Union Scientific-Research Institute of Corn, such highly productive corn hybrids as Dneprovskiy 56 TB, Dneprovskiy 98, Dneprovskiy 247, Dneprovskiy 460 and Dneprovskiy 125 were created and subsequently regionalized in many oblasts, krays and republics of the Soviet Union. These hybrids surpass the standards in terms of grain yield by 4-10 quintals per hectare and in fodder -- by 50-100 quintals per hectare. The Dnepr Scientific-Production Association is devoting a great amount of attention to the accelerated creation and introduction of early and mid-season ripening and also high lysine corn hybrids.

One large-scale problem of science and practical work is that of industrial technologies for the cultivation of corn, sugar beets, sunflowers, cotton, potatoes and vegetable crops. Such technologies were employed on more than 4 million hectares in 1982.

More than 60 zonal systems have been prepared based upon the development of all-union comprehensive systems for protecting the principal agricultural crops against pests, diseases and weeds. The introduction of a system for alternating acaricides on 2 million hectares in the country's cotton growing regions has produced an annual economic savings of up to 190 million rubles and for the 10th Five-Year Plan as a whole -- approximately 800 million rubles. In addition, a considerable reduction has taken place in environmental

contamination. The criteria have been developed for the economic thresholds of damage caused by 75 types of the principal pests and a number of diseases and this is optimizing the phytosanitary condition of the sowings and reducing the degree to which the plants are being treated with pesticides.

The All-Union Scientific-Research Institute of Biological Methods for the Protection of Plants has recommended prolonged storage for trichograms; this will increase the productivity of the biofactories by a factor of 1.5-2. The mechanized release of trichograms can increase labor productivity in the carrying out of this work by a factor of 12-15. The use of a complex of biological agents on glass-covered ground will reduce considerably the number of chemical treatments.

Forecasts on the number of pests and diseases, developed at VIZR [All-Union Institute for the Protection of Plants/ jointly with TsINAO [Central Institute of Agrochemical Services for Agriculture/ and republic scientific-research institutes for the protection of plants, are streamlining the preventive and protective measures, making it possible to optimize the volumes of extermination work, lower the adverse effect they exert on the biosphere and achieving economies in the use of resources. On the average, extermination work in the USSR is being reduced by a factor of two and this is producing an annual economy in excess of 150 million rubles. During the 10th Five-Year Plan, crops valued at approximately 37 billion rubles were protected as a result of the use of plant protection agents.

Land reclamation is a most important factor for raising the stability of farming, which is of importance from both an economic and socio-political standpoint. Over the past 60 years, a tremendous amount of land reclamation work has been carried out in the USSR and the land reclamation science has taken shape. Extensive use is being made of highly productive sprinkling equipment designed by Soviet scientists, equipment which at the present time is servicing more than one third of the irrigated land. It has raised the productivity of the irrigation personnel by a factor of 5-6.

Technical progress has been achieved in drainage work through the introduction of systems developed by Soviet scientists for the bi-lateral control of soil water regimes, designs for closed horizontal and vertical drainage and a non-trench technology for the laying of plastic drainage pipe. A distinctive feature of modern land reclamation -- its comprehensive nature. Comprehensive land reclamation construction work and the agricultural development of new lands, employed for the very first time in the Golodnaya Steppe region of the Uzbek SSR, are now being used on an extensive scale in many regions of the country: Kazakhstan, Belorussia, the Far East, the Volga region and the nonchernozem zone of the RSFSR.

The active transformation of the earth's surface over vast territories, typical of this modern stage in the life of the planet, is bringing about a sharp deterioration in the biological and ecological equilibrium of the agricultural ecological systems. But under modern conditions farming can only be developed successfully with bioecological optimization of the agricultural landscapes. Scientists attached to the All-Union Scientific-Research Institute of Agricultural Afforestation and other scientific institutes of the USSR have

established the fact that protected forest plantings in transformed forest-agricultural landscapes enrich the plant and animal life, add variety to and enrich the environment and raise the productivity of the agricultural plants. Scientists attached to the All-Union Scientific-Research Institute of Agricultural Afforestation and republic branch scientific institutes are introducing into production operations the means and methods required for restoring eroded lands and raising the productivity of pasture lands in arid zones. Effective methods have been developed for making badly eroded sloping lands once again available for agricultural use. Worthless lands are once again being transformed into very valuable natural and economic objects.

One principal trend to be pursued for solving the food problem -- optimization of the nutritional structure for the Soviet man. In this regard, the academy is devoting a great amount of attention to the carrying out of animal husbandry studies. During the years of the 10th Five-Year Plan, seven strains and pedigree groups, 13 types and 83 highly productive lines of agricultural animals were bred in the USSR. Technologies were developed for producing animal husbandry products on an industrial basis.

Under the direction of VASKhNIL Academician N.P. Rostovtsev, a new type of beef cattle based upon a crossing of the Kazakh White-Head, Aberdeen-Angus and Charolaise strains is being created at the Moskalevskiy Sovkhoz in Kustanay Oblast. Over the past few years, new strains of hogs have been created -- Belorusskaya, Black-Variegated and Semirechenskaya and also specialised meat types of hogs -- Poltavskiy, Donskoy, Kemerovskiy, Belorusskiy and Moskovskiy. In the case of pure strain breeding and also in crossings and hybridization, these animals are producing high productivities under conditions involving the use of industrial technologies. The scientific institutes for poultry production have supplied production operations with highly productive crossings of poultry.

A group of scientists and specialists was awarded the State Prize of the USSR for 1982 for creating and introducing Karakul sheep of new types of ash-grey, rose and white coloring and also Bukhara and Surkhan-Darinskaya strains. A collective of scientists at VIZh [All-Union Scientific-Research Institute of Livestock Breeding], jointly with scientists of the Latvian Scientific-Research Institute of Animal Husbandry and Veterinary Science was awarded the prize of the USSR Council of Ministers for having developed and introduced the Seleks system of large-scale breeding in dairy cattle husbandry.

For having introduced a technology and for organizing production at a large dairy complex of a breeding plant -- the Kolkhoz imeni Lenin in Tula Oblast -- the farm's specialists, jointly with VIZh scientists, were awarded the state prize of the USSR.

Under conditions involving concentration of the animals and industrial technologies, priority importance was attached to protecting the health of the animals. The scientists working in this sphere created more than 160 biological preparations, one half of which conform to the international level in terms of their quality characteristics, 13 surpass it, 20 do not have analogs abroad and 62 preparations are being exported to other countries.

For the first time in world history, vaccines for combating trichophytosis in animals were created at the All-Union Scientific-Research Institute of Experimental Veterinary Science imeni Ya.R. Kovalenko. They are being patented in 16 countries throughout the world, with 150 million dosages being produced each year. Licenses for the production of TP (LTP) vaccine have been sold to the U.S.A. The State Prize of the USSR was awarded for the creation of these vaccines. Vaccines for combating trichophytosis in fur-bearing animals and horses have been developed and are in production.

A live vaccine for combating rhynotracheitis in cattle has been introduced into operational practice and this has reduced sharply the spread of this disease.

Scientists at the All-Union Institute of Helminthology imeni K.I. Skryabin have proposed biologically sound methods for preventing and combating helminthosis in animals. According to data supplied by the USSR MSKh /Ministry of Agriculture/, the introduction of these methods has prevented losses in animal husbandry products amounting to 900 million rubles in just 5 years alone. The State Prize of the USSR was awarded for this work.

Various works carried out by a number of scientific-research institutes of a veterinary nature, jointly with the Institute of Zoology of the USSR Academy of Sciences, have no analogs in international practice. A system of measures for combating hypodermatosis in cattle, introduced throughout the country as a whole, has prevented losses in animal husbandry amounting to approximately 479 million rubles. The prize of the USSR Council of Ministers was awarded for this work.

A theoretical and applied solution has been found for the use of aerosols in industrial animal husbandry. In 1982 a group of scientists and specialists was awarded the State Prize of the USSR for having developed and introduced aerosol forms for chemical and biological preparations for preventing and combating infectious diseases in animals.

We also have scientific achievements in feed production. During the 1970's, a progressive technology for creating and using cultivated pastures was developed and employed on an extensive scale. It includes land reclamation methods and the cultivation and preservation of grasses and it makes it possible to increase the productivity of lands by a factor of four. The authors of this work were awarded the State Prize of the USSR. Under the direction of Academician N.T. Nechayeva of the Academy of Sciences for the Turkmen SSR, scientific principles and a comprehensive technology were developed for creating desert pastures using grasses, subshrubs, shrubs and strains of trees. In this manner it is possible to raise the productivity of desert feed lands by a factor of 2-3 and to ensure their use over a period of many seasons.

At the All-Union Scientific-Research Institute of Feed, during the years of the 9th and 10th Five-Year Plans, extensive and comprehensive studies were carried out in connection with evaluating the intensive methods of meadow management within the system "soil - plant - animal - animal husbandry product." These works were valued very highly during the 12th International

Congress on Meadow Culture. A group of scientists at this institute developed and introduced remote control methods for a large-scale study and mapping of natural pastures and haying and reclamation fund land, based upon the use of aerial and space photographs. Thus a considerable acceleration is taking place in geobotanical studies.

The country's scientific-research institutes have developed a system of intensive feed production on field lands. From 1 hectare of non-irrigated land in the nonchernozem zone of the RSFSR it is possible to obtain 5,000-7,000 feed units, in the forest-steppe and steppe zones -- 3,500-5,000 and under irrigation conditions -- 10,000-15,000. With the introduction of this system on forage crop sowings, it is possible to obtain almost 100 million additional tons of feed units. In recent years the scientist-technologists have developed methods for ensiling green plants using chemical preservatives -- formic, propionic and benzoic acids. Their use preserves 92-95 percent of the nutrients in the feed. The scientists are under an obligation to provide scientific support for this newly created specialized branch -- feed production. The real and mass introduction of scientific recommendations will aid in the development of this branch which is of great importance to animal husbandry operations.

A powerful technical potential has been created in the rural areas, the power capabilities of agriculture have reached 603 million horsepower and the power-worker ratio -- 27 horsepower. The scientists of engineering institutes have made a considerable contribution towards scientific-technical progress in agriculture. Over the past 17 years, 884 new machines and devices have been designed and assigned for industrial production, including the MTZ-80, MTZ-82, T-150, T-150K and K-701 high speed tractors. Agricultural machines and implements were created for these high speed tractors by the specialists at VIM [All-Union Scientific-Research Institute of Agricultural Mechanization]. Such units are raising labor productivity by a factor of 1.3-1.5. The USSR State Prize was awarded for this work, directed by VASKhNIL Academician V.N. Boltinskiy.

Highly productive beet harvesting six-row combines were designed based upon the use of basically new working organs. By reducing the harvest periods, they make it possible to lengthen the growing season for sugar beets. The USSR State Prize was also awarded for this work. The scientists at VIM made a basic contribution towards the creation of anti-erosion equipment for soil-protective farming in Kazakhstan. Work has been completed on designing working organs for grain harvesting combines of the Don type and other grain harvesting equipment.

Large-scale improvements have been carried out in the all-round mechanization of milk, meat, wool and egg production operations. In 1965 none of the country's farms had comprehensive mechanization and yet by 1980 it was present at 45 percent of the cattle farms, 63 percent of the hog farms and 72 percent of the poultry farms.

The agricultural economists have devoted priority attention to methods for improving the rates and stability for the development of agricultural production. For the very first time in the country's history, under the

direction of the Communist Party and with the direct participation of scientists, a special purpose comprehensive USSR Food Program for the period up to 1990 has been developed and approved by the May Plenum (1982) of the CPSU Central Committee. Food programs have been developed for large regions of the country.

The scientist-economists, together with other specialists, composed a forecast for the development and distribution of agricultural production by union republics and economic regions of the RSFSR for 1985, a draft general plan for the development and distribution of the productive forces of agriculture for the period up to 2005 and also an "Agriculture" section for the comprehensive program for scientific-technical progress in the USSR during the 1986-2005 period.

As completed, the scientific-research works on economic subjects are being introduced into production operations in an active manner. During 10 months of 1982 alone, 13 works were approved by the Presidium of VASKhNIL, the Scientific-Technical Council, the Board of the USSR Ministry of Agriculture and USSR Gosplan. Included among them were "Recommendations for Organizing Cost Accounting Mechanized Subunits Which Operate On the Basis of the Job Contract Plus Bonus Wage System and Temporary Advances in Field Crop Husbandry (collective contract)," "Principal Methodological Conditions for the Development of a Special Purpose Food Program in an Oblast, Kray or Autonomous Soviet Socialist Republic" and others.

There are more than 400 experimental-production farms within the VASKhNIL system. A considerable increase has taken place in the role they play in the production of seed for high reproductions. During the 1976-1980 period and compared to the preceding five-year period, the sale of elite and 1st reproduction grain crop seed to kolkhozes and sovkhoses by experimental farms of scientific-research institutes within the VASKhNIL system increased by an average of 34 percent annually and in the case of seed for oil-bearing crops -- by 31 percent. The gross production of grain during the 1976-1980 period and compared to the previous five-year period increased by 22 percent at the experimental farms and the yield increased by 3.4 quintals per hectare. In 1982, notwithstanding the unfavorable weather conditions, the grain crop yield at experimental farms of VASKhNIL amounted to 27 quintals per hectare. All of these farms ended the year 1982 with profits.

The regional branches of VASKhNIL are exerting a noticeable effect on drawing the scientific management of agriculture closer to the local, specific soil-climatic, economic and other zonal conditions.

In recent years the all-union branch institutes have carried out large-scale and comprehensive work on farming and animal husbandry. Zonal and scientifically sound systems of farming are being introduced into operations in all oblasts, krays and autonomous republics. During the 10th Five-Year Plan and compared to the 9th, the mastering of soil-protective zonal systems of farming in Stavropol Kray increased grain production by 22 percent and in extremely arid regions -- by 40 percent. The cropping power and gross yields for forage crops have been increased substantially.

Siberia has become a large center for agricultural science. Everyone is familiar today with the works of Siberian scientists in plant breeding and seed production for agricultural crops, in achieving a balance in soil fertility and in soil-protective systems. New and highly productive varieties

of agricultural crops are being introduced into production operations, including those bred jointly by scientists of the Siberian Branch of VASKhNIL, the Siberian Branch of the USSR Academy of Sciences and other institutes. Areas occupied by such varieties as Novosibirskaya 67 spring wheat, Omskaya 9 wheat, Omskiy barley, Belozernyy oats and Tulunskaya Hybrid alfalfa are being expanded. A large group of scientists of the Scientific-Research Institute of Horticulture for Siberia imeni M.A. Lisavenko was awarded the State Prize of the USSR in 1981 and in 1982 a group of scientists attached to SibNIISKhOZ /Siberian Scientific-Research Institute of Agriculture/ and party and economic workers in Omsk Oblast were awarded the prize of the USSR Council of Ministers for having developed and introduced zonal agricultural complexes. Scientists in Siberia and the Far East are participating specifically in providing scientific support for the agricultural development of lands falling within the BAM /Baykal-Amur Trunkline/.

Scientific institutes in the nonchernozem zone of the RSFSR, jointly with specialists of the RSFSR MSKh /Ministry of Agriculture/ and local agricultural organs are introducing systems for both farming and animal husbandry into operations. Today varieties bred by scientists attached to the branch for the nonchernozem zone of the RSFSR are being cultivated on more than 10 million hectares.

The relationship between science and production at institutes of the branch for the nonchernozem zone of the RSFSR is being maintained through the creation of scientific-production associations. Successful work is being performed by the Belogorka NPO /scientific-production association/ and the plans call for the organization of six more scientific-production associations.

The use of scientific achievements and great organizational work in the various areas are promoting improvements in the agricultural crop yields. Despite difficult weather conditions during 1982, all oblasts in the nonchernozem zone of the RSFSR fulfilled their plans for grain sales to the state.

In recent years, the institutes of the Southern Branch, one of the largest branches of VASKhNIL, have displayed greater activity. The works carried out by the scientists are being introduced into operations on farms in the Ukraine and Moldavia, in other union republics and abroad. Extensive use is being made of a technology for the industrial production of tomatoes using a domestic complex of machines. On irrigated lands, this technology produces up to 500 quintals of fruit per hectare, with labor expenditures decreasing by a factor of three.

Scientists attached to the Scientific-Research Institute of Animal Husbandry for the Forest-Steppe and Forest District of the Ukrainian SSR have been awarded the prize of the USSR Council of Ministers for having introduced a technology for the cryogenic preservation of the semen of bulls. An industrial type of meat hog, created at the Poltava Scientific-Research Institute of Hog Raising, is being employed extensively in the Ukraine, Belorussia and other republics. Scientists attached to the Ukrainian Scientific-Research Institute for the Mechanization and Electrification of Agriculture have created a grain separator, a license for which has been sold to a Swedish firm.

During 60 years of Soviet rule, agriculture in Kazakhstan and Kirghizia has changed beyond recognition; a path has been followed leading from nomadic and semi-nomadic animal husbandry to modern and highly mechanized farming and animal husbandry. The development of the virgin lands has transformed the national economy of Kazakhstan. The republic has become one of the country's leading grain areas. The production and purchases of animal husbandry products have increased considerably. These achievements reflect the services rendered by the agricultural science, concentrated in the Eastern Branch of VASKhNIL.

Scientists attached to the Eastern Branch are carrying out extensive studies associated with the mastering of solonetz soils. Their introduction into agricultural use will constitute a new stage in the development of agricultural production in this region of the country.

The chief task of the central Asian region -- to increase the production of cotton. The Central Asian Branch of VASKhNIL, jointly with the academies of sciences of union republics, are carrying out the all-round "Khlopok" Program. The region's scientists have developed scientifically sound forecasts for the economic and social development of agriculture in the region for the period up to 1990. The creation of wilt-resistant and highly productive varieties of cotton and an industrial technology for cultivating it have become new areas for development of the branch. During the 10th Five-Year Plan, 20 new varieties of cotton were regionalized and more than 37 million tons of raw cotton were sold to the state.

Scientists attached to the Western Branch of VASKhNIL are introducing zonal systems for the management of agriculture which are aimed at achieving highly efficient use of land resources, intensifying farming operations, raising the fertility of soils and the agricultural crop yields and converting animal husbandry over to industrial technologies. During the years of the 10th Five-Year Plan, 39 new and highly productive varieties of grain, potato, flax, forage, vegetable and fruit and berry crops were regionalized in republics in the western region.

The work of the Trans-Caucasus Branch of VASKhNIL is concentrated on problems concerned with mountain farming, citrus crop production, vegetable growing, horticulture and tea production.

The scientists attached to VU throughout the country, which train highly skilled personnel for production, and also to scientific institutes are making a great contribution towards the development of agriculture and science. They are actively participating in working out many vital APK /agroindustrial complex/ problems and they are publicizing scientific knowledge among the agricultural workers.

Recently, approval was given for a program of scientific studies by the USSR Academy of Sciences, the academies of union republics and VASKhNIL, which will be of assistance in implementing the USSR Food Program. The combined efforts of the scientists are accelerating to a considerable degree the solving of problems associated with development of the agroindustrial complex and raising the efficiency of agricultural production. The agricultural scientists are applying all of their knowledge and energy in the interest of implementing the great plans for agricultural development -- the chief element of the country's agroindustrial complex.

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REGIONAL DEVELOPMENT

WORK OF VASKhNIL PRESIDIUM SESSIONS DISCUSSED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 83 pp 139-142

[Article: "In the Presidium of VASKhNIL"]

[Text] During one particular session of the Presidium of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V.I. Lenin], a discussion was held on a report delivered by VASKhNIL Academician Yu.N. Fadeyev on the status of studies called for in a special purpose comprehensive program and on the tasks of scientific institutes on studying and developing measures for combating root rot in grain crops, in connection with implementation of the USSR Food Program. One most important reserve for raising the grain crop yields and quality is that of improving and introducing a reliable system of measures for protecting grain crops against this disease.

In recent years, the country's scientific institutes (VIZR [All-Union Institute for the Protection of Plants], the Moscow Branch of VIR [All-Union Scientific Research Institute of Plant Growing], the Siberian NIIZKhim, Ukrainian NIIZR, Belorussian NIIZR, Lithuanian Scientific Research Institute of Farming, Krasnoyarsk NIISKh [Scientific Research Institute of Agriculture] and others) have developed and introduced complexes of protective measures for the principal production regions for commodity grain. As a result of studies carried out in regions of western Siberia, methods have been recommended for the differentiated use of agrotechnical and other protective measures, based upon phytopathological soil cartograms and phyto-examination of seed. Agroecological measures are being developed for combating the disease which are based upon maximum use and stimulation of the natural protective factors of nature.

In regions of intensive grain production in the European part of the country, chemical methods are being introduced for protecting grain crops from a degree of contamination. The use of fungicides together with intensive grain production has proven to be highly effective.

In the Moscow Branch of VIR and in a number of plant breeding centers throughout the country, an evaluation has been carried out on regionalized varieties with regard to the types of root rot and methods are being developed for creating artificial infection backgrounds, for accelerating an evaluation of disease resistance and also the selection principles employed during the plant breeding

process. At the same time, the problem of combating root rot in grain crops requires the fixed attention of scientists and specialists experienced in the protection of plants. At the present time, there is not one variety among the existing diversity of regionalized and promising varieties that possesses an adequately high level of resistance against the more widespread helminthosporiosis or root rot. Among the diverse international varieties of spring wheat and barley, only individual specimens have been uncovered which can be considered as sources for disease resistance. In the majority of grain regions there is a shortage of the pesticides required for combating root rot, the assortment of such pesticides is limited and no thorough study has been undertaken of the mechanism of "acclimatization" of the pathogens to the pesticides. The biological method for combating root rot through the use of microbe-antagonists and biologically active substances has not gone beyond the area of preliminary testing. Considerable efforts are required in order to improve the methods for calculating and forecasting the spread and development of rot epiphytes of grain crops. Phytopathological support for the plant breeding process has not been developed adequately, there are no reliable artificial infection backgrounds, high speed methods for evaluating the resistance of plants are lacking and the selection principles for use during various stages of the plant breeding process have not been developed.

The Presidium of VASKhNIL has approved a program of studies for developing a complex of effective measures for combating root rot in grain crops and has tasked the Plant Protection Department (Professor N.M. Golyshin) and the Department of Field Crop Husbandry and Plant Breeding (Academician of VASKhNIL A.V. Pukhal'skiy) with undertaking measures aimed at carrying out the stages of scientific work defined in the program of studies. The Presidium of VASKhNIL has requested the USSR Ministry of Agriculture to task subordinate institutes with carrying out work on subjects set forth in the planned program. In addition, the Presidium has recognized the need for creating a Committee on Grain Crop Root Rot attached to the Plant Protection Department of VASKhNIL. This permanent committee will serve as a methodological and coordination center for the development of studies and for summarizing achievements with regard to the development of measures for combating this disease. The Presidium of VASKhNIL has tasked the All-Union Scientific-Research Institute of Plant Protection (Corresponding Member of VASKhNIL K.V. Novozhilov), the All-Union Scientific-Research Institute of Applied Molecular Biology and Genetics (Academician of VASKhNIL G.S. Muromtsev), the Moscow Branch of VIR (A.M. Medvedev) and the managements of the Siberian, Southern, Western and Eastern Branches of VASKhNIL with undertaking the necessary measures for ensuring personnel and logistical support for those laboratories working on the problem of grain crop root rot. The Moscow Branch of VIR must prepare methodological instructions for evaluating the resistance of cereal grain crops to root rot, while taking into account the latest scientific achievements bearing upon this problem.

* * *

During its next session, the Presidium of VASKhNIL examined the status and development of studies on the trends called for in the special purpose comprehensive scientific-technical program for solving the feed protein problem in light of the decree handed down during the May (1982) Plenum of the CPSU Central Committee and the USSR Food Program. A speech was delivered by

the director of the All-Union Scientific-Research Institute of Feed imeni V.R. Vil'yams, Corresponding Member of VASKhNIL M.A. Smurygin. The All-Union Institute of Feed and other scientific institutes throughout the country have carried out a considerable amount of work aimed at increasing the production of plant protein by intensifying field feed production and the meadow and pasture economy, technologies for the preservation and storage of feed, breeding forage crop varieties and hybrids possessing a high protein content and developing appropriate plant breeding methods and seed production systems.

Based upon studies carried out, recommendations have been made calling for a more improved structure for the forage crop sowing areas, for zonal systems of feed crop rotation plans having a high saturation of perennial leguminous and cereal grasses and for agrotechnical methods which will ensure an increase in the cropping power and yield of protein per unit of space. New and progressive technologies are being introduced into operations on an extensive scale for multiple-cutting utilization of grass stands, for the cultivation of mixed sowings of leguminous and cereal grasses, for the creation and use of cultivated haying and pasture lands and for the procurement and storage of feed involving the use of chemical preservatives, forced ventilation and other progressive methods and means for ensuring a substantial increase in the yields and preservation of feed protein.

The country's plant breeders have bred a number of highly productive varieties and hybrids of forage and grain forage crops which are making it possible to increase the yield of feed protein by 15 percent or more. At the same time, the deficit in feed protein amounts to 3-5 million tons and this is leading to an annual overexpenditure of 35-45 billion feed units. During the 10th Five-Year Plan the production of pulse crops decreased considerably, with no increases taking place in the clover, alfalfa and sainfoin areas. Disruptions in the technologies employed for the procurement and storage of feed lead to substantial losses in protein.

Further improvements must be realized in the zonal structure of the sowing areas for grain forage and pulse crops by expanding the sowings of barley, oats, corn, sorghum, soybeans, peas, vetch and also high protein perennial grasses -- alfalfa, clover and sainfoin. A requirement exists for creating forage crop varieties having a raised protein content and an improved amino acid structure; storehouses are required for silage, haylage, hay and other feeds. Importance is attached to improving the agrotechnical fertilization methods and systems aimed at increasing the production of protein; new chemical preservatives must be found which will ensure a high degree of preservation for the protein and other nutrients in the feed.

More studies must be carried out directed towards finding additional sources for feed protein, synthetic nitrogenous substances and amino acids, by means of microbiological and chemical synthesis, and also for raising the efficiency of use of feed protein. A single coordination center is required for the feed protein problem.

The Presidium of VASKhNIL decrees: that the Department of Feed Production (Corresponding Member of VASKhNIL I.P. Proskura), the Department of Field Crop Husbandry and Plant Breeding (Academician of VASKhNIL A.V. Pukhal'skiy), the

Department of Farming and Use of Chemical Processes (VASKhNIL Academician N.P. Panov), the Department of Animal Husbandry (VASKhNIL Academician A.P. Kalashnikov), the Department for the Mechanization and Electrification of Agriculture (VASKhNIL Academician G.Ye. Listopad) and the regional branches of VASKhNIL must concentrate the efforts of their subordinate scientific institutes on developing to the maximum possible degree all studies concerned with the feed protein problem, with special attention being given to improving the structure of the grain forage and forage crop growing areas and feed crop rotation plans by zones of the country, in the interest of achieving maximum product yield per unit of space and a self-supporting protein balance in the feed, while taking into account specialization in the animal husbandry branches; the development of efficient technologies for raising the yields of plant protein and improving its quality in the various types of feed; raising the protein content and improving its amino acid structure in grain forage and forage crops using plant breeding-genetic methods, recommendations should be developed for increasing the production of seed for perennial grasses, especially alfalfa, clover, pulse and cruciferae family crops; expand studies aimed at introducing new types of feed plants into production operations; recommend more improved technologies for the procurement, storage and preparation of feed for feeding to the animals, so as to ensure a high degree of preservation and use of the protein. The production operations are in need of highly productive machines and implements for the complete mechanization of feed procurement and storage operations, with maximum preservation of the protein being ensured; efficient types of storehouses for the various types of feed, taking zonal peculiarities into account; new methods for enriching the feed with highly effective protein additives, feed nitrogen-containing synthetic compounds and amino acids; improvements in the recipes for the mixed feed -- balanced feeding for the agricultural animals in terms of protein, amino acids and other components, with maximum economies being realized in the use of grain.

The All-Union Scientific-Research Institute of Feed, the All-Union Scientific-Research Institute for Pulse and Groat Crops, the Ukrainian Scientific-Research Institute of Farming, the Scientific Research Institute of Agriculture for the Central Regions of the Nonchernozem Zone, the All-Union Plant Breeding Institute and the Belorussian Scientific-Research Institute of Farming are tasked with expanding the plant-breeding and genetic studies concerned with the creation of highly productive varieties of annual pulse feed crops, with special attention being given to the breeding of varieties which are immune to fusarial wilt. The All-Russian Scientific-Research Institute of Soybeans, the All-Union Scientific-Research Institute of Oil-Bearing Crops, the Stavropol Scientific-Research Institute of Agriculture, the Ukrainian Scientific-Research Institute of Farming, the Ukrainian Scientific-Research Institute of Irrigation Farming and the Georgian Scientific-Research Institute of Farming must intensify their studies on plant breeding, seed production and the development of industrial technologies for the cultivation of soybeans. The All-Union Scientific Research Institute of Field Crop Husbandry and the All-Union Scientific Research Institute of Feed must create a gene fund for forage crops, as required for the breeding of highly productive varieties and hybrids containing a raised protein content.

The All-Union Scientific-Research Institute of Corn and the Krasnodar Scientific-Research Institute of Agriculture must intensify their work of

creating high-lysine varieties and hybrids of corn; the All-Union Scientific-Research Institute of Feed, the All-Union Plant Breeding-Genetics Institute and the Northwestern and Northeastern Scientific-Research Institutes of Agriculture -- on methods for increasing the protein content in grain forage and feed crops, the Siberian Scientific Research Institute of Feed, the Siberian Scientific-Research Institute of Agriculture, the Krasnoyarsk Scientific-Research Institute of Agriculture, the Kazakh Scientific-Research Institute of Farming and the Northern Scientific-Research Institute of Animal Husbandry must expand the development of a technology for cultivating sweet clover and its mixtures on saline soils and also rape and other cruciferae family crops for the purpose of increasing the production of feed protein; the Kazakh Scientific-Research Institute of Meadow and Pasture Management, the Uzbek Scientific-Research Institute of Animal Husbandry and the Kirghiz Scientific-Research Technological Institute for Pastures and Feed must intensify their studies on methods for reducing the protein deficit during the autumn and winter period in connection with the year-round pasture maintenance of sheep.

The All-Union Scientific-Research Institute of Animal Husbandry and the zonal, branch and republic scientific-research institutes of animal husbandry must recommend new and improve existing standard and zonal rations for the summer feeding of milking cows, beef cattle and sheep, in order to ensure more efficient use of the surplus protein found in green feed and also for the purpose of intensifying studies associated with raising the efficiency of use of feed protein in animal husbandry.

The Department of Farming and Use of Chemical Processes, the Department of Feed Production, the Department of Field Crop Husbandry and Plant Breeding and regional departments of VASKhNIL must intensify their studies aimed at achieving an efficient combination and utilization of the biological and mineral nitrogen of the soil, by the plants, in order to increase the production of feed protein.

The USSR Academy of Sciences and USSR Glavmikrobioprom will develop efficient methods for obtaining high protein feed additives, feed synthetic nitrogen-containing substances and amino acids (particularly lysine), based upon chemical and microbiological synthesis. Towards this end, extensive use should be made of the secondary products of field crop husbandry, forestry resources and other energy-containing materials. In addition, an expansion must take place in studies aimed at employing new types of non-food plant raw materials for the production of hydrolytic nutrient yeasts.

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The regular session of the Presidium of VASKhNIL was dedicated to the work of the Western Branch of VASKhNIL with regard to raising the fertility of soils in Belorussia. The academician-secretary of the Western Branch of VASKhNIL, Academician T.M. Kulakovskaya, delivered a report on the work carried out in Belorussia in raising the fertility of soils.

Guided by the decisions handed down during the 26th CPSU Congress and the May (1982) Plenum of the CPSU Central Committee, the Western Branch of VASKhNIL,

jointly with the zonal scientific-research institutes, carried out a great amount of work in implementing measures aimed at further intensifying agricultural production and carrying out the tasks assigned to the science of agriculture. The measures call for solutions to be found for a number of important scientific-technical problems in the area of improving soil fertility and utilizing the soils in an efficient manner, thus making it possible to raise considerably the agricultural crop yields. Important work is being carried out by the republic's scientific-research institutes in connection with establishing optimum parameters for fertility and programming the agricultural crop yields. Many of the republic's kolkhozes and sovkhoses, through the introduction of scientific developments, have achieved high and stable yields (the Osnezhitskiy Kolkhoz and the sovkhoses 60 Let Kompartii Belorussii and Malech in Brest Oblast and also a number of farms in Slutskiy, Molodechnenskiy, Vileyskiy and Nesvizhskiy Rayons in Minsk Oblast).

A great amount of attention is being given to the problems of soil reclamation and the use of chemical processes in farming. Approximately 2.5 million hectares have been reclaimed in Belorussia, or roughly one out of every three hectares of land in need of improvement. The liming of acid soils is being carried out in a successful manner and a considerable increase has taken place in the use of chemical materials, especially mineral fertilizers. Studies associated with comprehensive programs have made it possible to intensify considerably those theoretical works concerned with raising the fertility of soils and also to accelerate the introduction into production operations of the results obtained from regionalization of the soil cover, cartography, soil evaluations and the use of fertilizers.

Although the agricultural crop yields in the republic have increased, nevertheless in recent years the productivity indicators for field crop husbandry and animal husbandry have stabilized at a low level (21.3 quintals per hectare of grain crops and an equivalent amount of other products) and this does not conform to the logistical resources which the republic's kolkhozes and sovkhoses have at their disposal.

Unfortunately, the scientific institutes of Belorussia do not have base farms at their disposal which operate under various soil-climatic conditions and where it would be possible to work out a technology for the expanded reproduction of soil fertility and for obtaining high and stable yields for the agricultural crops.

Included among the shortcomings in organizing studies and introducing their results into operational practice are interdepartmental isolation of those services concerned with utilization of the soil cover and the absence of an economic analysis of the efficiency of use of logistical resources for the purpose of achieving expanded reproduction of soil fertility and growth in the agricultural crop yields. In addition, the scientific institutes are not being adequately supplied with laboratory equipment and instruments.

The Presidium of VASKhNIL has approved the work of the Western Branch of VASKhNIL in raising the fertility of soils in Belorussia. Special emphasis has been placed upon the positive operational experience accumulated by the republic's scientists in the distribution and use of mineral and organic

fertilizers, in the development of specialized crop rotation plans and in the creation of a positive balance for the humus and principal plant nutrients found in the soil.

The Presidium of VASKhNIL has obligated the Bureau of the Western Branch of VASKhNIL, jointly with the zonal scientific-research institutes, to eliminate rapidly the shortcomings noted in the scientific-research work and in organizing the introduction into operations of completed works associated with raising soil fertility and agricultural crop yields; to intensify the solving of problems which will promote a more successful implementation of the USSR Food Program, with special attention being given to the comprehensive use of chemical and farming materials, to raising the quality of the agricultural products and to protecting the environment against contamination; to improve the work of expanded reproduction of soil fertility in the Belorussian SSR and the Baltic republics, thus making it possible to obtain the planned agricultural crop yields; to raise the level of economic studies associated with establishing optimum parameters for soil fertility in the republic's zones and the effectiveness of scientific works being introduced into production operations. To improve the scientific-methodological management of research work in Belorussia, with special attention being given to those theoretical problems which are of vital importance for raising the productivity of farming in the western region of the country and to employing an all-round approach for creating a model of soil fertility. A more thorough study should be undertaken of the agrophysical and biological indicators of soil fertility, thus making it possible on this basis to obtain high and stable yields on the republic's farms and to find the means for raising the effectiveness of the logistical resources being invested in farming, particularly fertilizers, so as to pass the average grain crop yield limit of 20-25 quintals per hectare and attain the level of 40-45 quintals per hectare, as called for in the decision handed down during the May (1982) Plenum of the CPSU Central Committee.

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REGIONAL SPECIALIZATION, DISTRIBUTION OF AGRICULTURAL PRODUCTION ADVANCED

Moscow *Ekonomika S S L'SKOGO KHOZYAYSTVA* in Russian No 7, Jul 83 pp 3-12

[Article by D. Vermel' and S. Tolpygin: "Improvements in Distribution and Regional Specialization of Agriculture"]

[Text] During the period of developed socialism, important strategic tasks of the Soviet economy include improvements in the distribution of productive forces in the interest of raising the efficiency of public production based upon further specialization and proportional development of the economies of Union republics and economic regions in a single national economic complex of the country and multiplying the contribution made by each republic and economic region in solving the state tasks, including one of the most important -- that of providing the country with food goods. The general secretary of the CPSU Central Committee, Yu.V. Andropov, in a report delivered during a ceremonial meeting dedicated to the 60th anniversary of the USSR, pointed out the special importance attached to solving these problems in connection with the further development of our economy. "The modern productive forces" he emphasized, "require integration even at those times when we are discussing various countries. Moreover, they require a close and skilful combining of the efforts of various regions and republics within the same country. The most judicious use of natural and labor resources and the climatic peculiarities of each republic and the most efficient inclusion of this potential in the all-Union potential -- this is what produces the greatest gain for each region and each nation and nationality, in the same manner as for the entire state.

Such is our principal aim. In order to realize it, a great amount of work must be carried out by our central and local planning and administrative organs. Further improvements are required in the distribution of the productive forces, in regional specialization and cooperation and in the plans for economic contacts and transport operations. Certainly, the task is not an easy one. But nevertheless it is at hand and its solution promises considerable gains" ("Shest'desyat let SSSR" /60 Years of the USSR/, Moscow, 1982, p 11).

The mentioned problems are of exceptional importance with regard to agricultural production in our country, which is being carried out on a vast territory and under extremely diverse economic and soil-climatic conditions. Their differences represent the objective basis and need for developing the territorial division of labor and regional specialization in agriculture.

This need is determined by the substantial influence being exerted by both the natural and economic conditions on growth in labor productivity and on improvements in the efficiency of agricultural production. "The productivity of farm labor" pointed out K. Marx, "is associated with natural conditions and, depending upon the productivity of the latter, the same amount of labor is represented in a greater or smaller amount of products or use values" (K. Marx and F. Engels, "Soch." [Works], Volume 25, Part II, p 383).

Of the economic conditions associated with developing the territorial division of labor, special importance is attached to transport and communications equipment. "Increases and improvements in the means of communications" commented K. Marx, "reduces the working time required for the production of a particular product and creates the intercourse required for spiritual and trade development. It exerts an influence on the productive force of labor in like manner as improved farming methods, chemical and geological progress and so forth" (Ibid, Volume 47, p 567). The means of communications and transport, while reducing time and space, at the same time promote the development and strengthening of economic relationships and an exchange between isolated spheres of activity and regions and between cities and rural areas.

In commenting upon the tremendous importance of transport and communication equipment for the country's national economy, Yu.V. Andropov emphasized that "In a state as vast as ours, a very special role is played by transport...."

In the absence of good transport operations, it is very difficult to achieve accelerated development for all of the republics or further strengthening of their economic collaboration." Moreover, the development of transport and the network of highways, by drawing the rural areas and cities closer together, will promote to a considerable degree the retention of personnel in the rural areas and solve a great social task -- efficient and flexible use of labor resources (Shest'desyat let SSSR, Moscow, 1982, p 12).

The size and density of the population, as the producer and consumer of agricultural products, constitute the chief foundation and material prerequisite for the territorial division of labor in the production of agricultural products. At the same time, K. Marx emphasized that "the density of the population is somewhat relative. A country which is comparatively weakly settled but has developed means of communications has in fact a more dense population than a more settled country that lacks developed means of communication..." (K. Marx and F. Engels, "Soch.," 2d Edition, Volume 23, p 365). During this modern stage in the development of science and engineering, it can be stated that the importance of a population's size, as a factor associated with the territorial division of labor, is even more relative than it was in the past. A relatively lightly populated territory which has a high level of development of productive forces for agriculture can be an extremely strong producer and supplier of agricultural products for other regions and play an important role in the territorial division of labor which, according to a definition provided by K. Marx, assigns "definite branches of production to definite regions of the country" (Ibid, Volume 23, p 366).

The strengthening and expansion of territorial division of labor, which V.I. Lenin defined as specialization "...of individual regions in the production of one product, at times of one variety of a product and even of a

portion of a product" ("Poln. sobr. soch." [Complete Works], Volume 3 pp 22-23) is carried out in our country taking into account the natural, economic, social and historic conditions of the regions and the increasing requirements of society. It ensures to a considerable degree growth in production and improvement in the productivity of social labor and in the quality of the products and at the same time it is an extremely important factor for socio-economic progress.

The classics of Marxism-Leninism have emphasized that the territorial division of labor, similar to social division of labor, is included among the general economic laws associated with the various social-economic formations.

In the development of territorial division of labor and regional specialization in agriculture in our country, several stages can be singled out. One of them coincides with the period of accelerated development of capitalism during the second half of the 19th Century, following the abolishment of serfdom. In his classical work entitled "The Development of Capitalism in Russia," V.I. Lenin stated that in addition to the extensive development of the territorial division of labor and industry, this process "is also manifested in farming through the creation of specialized farming regions (and agricultural systems) and by an exchange not only among farming and industrial products but also between the various products of agriculture" ("Poln. sobr. soch.," Volume, p 23). In the process, he emphasized that "...it is precisely in the isolation of the various farming regions that one finds the more typical features of agricultural reform in Russia" (Ibid, Volume 3, p 250).

V.I. Lenin described the regions of commercial grain economy, commercial cattle husbandry, flax production, truck farming and horticulture, in the suburban economy and industrial melon production which existed at that time. He singled out the regions of commercial farming which were specializing in the production of agricultural products that were undergoing industrial processing: distillation, beet sugar, potato-starch and oil production, tobacco production (see "Poln. sobr. soch.," Volume 3, pp 252, 256, 279, 285, 288, 291, 295 and 297). The entire structure of farming in specialized regions has adapted itself to obtaining maximum quantities of marketable products. "Capitalism" noted V.I. Lenin, "takes command over one such agricultural product and adjusts all of the remaining aspects of an economy to this chief product" (Ibid, Volume 3, p 264). At the same time, the latter is a typical feature of the very nature of farming specialization generally, which "...does not split up into completely separate branches but only specializes in the production in the one instance of a certain commercial product and in another instance, another product, with the remaining aspects of the economy adapting themselves to this chief (that is marketable) product. Thus the forms for commercial farming differ in terms of gigantic diversity, changing not only in various regions but also on various farms" (Ibid, Volume 3, p 309).

Regional specialization in agriculture assumes new meaning from a quality standpoint and unprecedented simplicity for its development under socialist, where it is carried out in a planned manner in the interest of making more complete use of the natural and economic resources available for achieving the greatest efficiency in social production and, on this basis, improvement in the material well-being of the population in all regions and throughout the country as a whole.

During the period of socialist construction in our country, the establishment of territorial division of labor in agriculture, similar to social division of labor, was associated with important stages in the development of our socialist society.

During the period devoted to consolidating socialism, at which time the organizational-economic strengthening of kolkhozes and sovkhozes was carried out, the food industry and production infrastructure were developed to a considerable degree and, on this basis, specialization of the Union republics and economic regions in the production of definite types of food goods and technical raw materials became more intense. In addition to developing regional specialization which existed during the pre-revolutionary period and which reflected the natural and economic conditions of the regions, during the years of socialist construction new specialized regions were created for the production of grain, industrial crops, fruit and vegetable growing and viniculture. Extremely important changes took place in the distribution and specialization of agricultural production as a result of implementation of economic policies aimed at achieving independence for the country and thus eliminating the need for having to import the principal types of agricultural raw materials. These changes reflected the need for satisfying the requirements of the country's population for food goods and other types of agricultural products under conditions involving a substantial change in their distribution and a growth in their requirements.

Prior to the early 1950's, the production of commodity grain was concentrated in the north Caucasus, the Volga region, western Siberia and in the central chernozem region of the RSFSR and the Ukrainian SSR; potatoes -- in the Baltic Republics, Belorussia and in the central chernozem and Volgo-Vyatsk regions of the RSFSR; meat -- in the Baltic Republics, Kazakhstan, the north Caucasus and in the central chernozem zone of the RSFSR; milk -- in the Baltic Republics, Belorussia, western Siberia and the central chernozem region of the RSFSR; eggs -- in the north Caucasus and Volga regions, the Baltic Republics and the Ukraine. The highly commercial production of sugar beets and sugar was distributed in the Ukraine, the central chernozem region of the RSFSR and Kirghizia; sunflowers -- in the north Caucasus and the central chernozem region of the RSFSR, the Ukraine and Moldavia; fruit, berries and grapes -- in the Trans-Caucasus Republics, Moldavia and the Ukraine; tea -- in Georgia; cotton -- in Uzbekistan, Turkmenia and Tajikistan; flax -- in the Baltic Republics and in the northern, northwest, central and Volgo-Vyatsk regions of the RSFSR (see "Problems of Inter-Farm Cooperation and Agroindustrial Integration," *SBORNIK NAUCHNYKH TRUDOV* /Collection of Scientific Works/, Issue 16 (99), Moscow, All-Union Scientific Research Institute of Agricultural Economics, 1981, pp 18-21).

The modern period in the development of inter-regional division of labor reflects the conditions of a developed socialist society and the implementation of a new stage in the agrarian policies of the party, the foundation for which was established during the March (1965) Plenum of the CPSU Central Committee.

Scientific progress and its attendant progressive changes in engineering and technology are transforming and revolutionizing the productive forces of society. On the one hand, this is bringing about greater differentiation in social production and the dismemberment of it into individual stages and phases, which are being singled out as independent branches and spheres of activity and concentrated in specialized production efforts and also an intensification of territorial division of labor and specialization for

individual regions. On the other hand, the inter-branch and intra-branch, international, inter-rayon and inter-farm relationships are expanding and becoming more complicated.

Under the conditions of developed socialism, the territorial division of labor, similar to the division of labor in society, is becoming a more efficient means for raising the effectiveness of functioning of the country's agro-industrial complex.

The economy of the Soviet Union, as defined by Comrade Yu.V. Andropov, is a "single Union national economic complex," formed on the basis of a "dynamic and special state plan for economic growth in all of the republics" ("Shest' desyat let SSSR," Moscow, 1982, pp 7-8).

The establishment of developed socialism in the USSR and the unfolding of the scientific-technical revolution signified the conversion to a new stage in the development of specialization in agricultural production in the union republics and economic regions.

During the period which has elapsed since 1965, the logistical base for the country's agroindustrial complex has undergone substantial development, the level of intensity of agricultural production has increased in all of its regions and the base for the processing and storage of agricultural products and for providing production and transport services has been strengthened. All of this has made it possible, based upon the planned implementation throughout the country of socialist territorial division of labor among the union republics and regions, to develop to a greater degree in a particular region those branches which have more favorable natural and economic conditions at their disposal. As a result, substantial changes have taken place in the structure of agricultural production in the Union republics and economic regions of the country.

Improvements in the distribution and intensification of regional specialization constitute an important factor for increasing the production of agricultural products (see table). During a comparatively brief period of time, with the size of the population increasing by 15 percent, substantial increases have taken place in per capita production: grain--by a factor of 1.4, including rice--5.1; vegetables--1.4, fruits and berries--2.3, grapes--1.8, tea--2.1, sugar beets--1.3, cotton--by more than 1.5, meat--1.4, milk--1.3 and eggs--by a factor of 1.9. As a result of development of the virgin and long fallow lands, the Kazakh SSR and the western Siberian and Urals economic regions have become the principal regions for valuable commodity bread grain, with high production levels for this product being maintained in the north Caucasus, Volga and central chernozem economic regions of the RSFSR. Regional specialization in the production of sugar beets has been intensified noticeably. Specialization is being carried out in the Belorussian SSR in the production of marketable potatoes and in the Georgian SSR--in early potatoes, with shipments being carried out to other regions of the country. Noticeable progress has been achieved in the distribution and regional specialization in vegetable production. Production growth in this branch has been achieved owing to the southern regions of the country: north Caucasus economic region of the RSFSR, southern Ukraine, Moldavia, the Trans-Caucasus and central Asian republics, growth in the production in these

Per Capita Production of Field Crop Husbandry and Animal Husbandry Products by Republics and Economic Regions of the RSFSR (annual averages for all categories of farms, in kg)

	(1) Страна		(2) В том числе: республика		(3) Сельское хозяйство (в млрд. тенге)		(4) Кредиты		(5) Оплата		(6) Прямые инвестиции		(7) Вспомогательные		(8) Механизация		(9) Механизация		(10) Механизация		(11) Механизация	
	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.	1961-1965 гг.	1976-1980 гг.
СССР (13)	562	769	277	374	255	333	352	310	73	99	16	36	12	21	56	279	346	124	237			
РСФСР (14)	605	818	305	386	147	183	357	294	66	75	7,9	17	3,8	5,1	53	286	347	130	264			
в том числе экономические районы:																						
Северо-Западный (15)	59	91	10	6	—	—	265	185	45	44	2,1	7,5	—	—	31	228	249	64	222			
Центральный (16)	208	340	49	76	50	48	475	389	78	64	7,6	11	—	—	28	259	311	109	245			
Восточный (17)	376	686	82	120	30	42	685	534	74	52	4,9	9,1	—	—	34	292	411	123	254			
Центрально-Черноморский (18)	1027	1396	317	561	1225	1626	559	453	83	96	18,2	5,2	—	—	56	436	576	194	355			
Поволжский (19)	1076	1398	483	627	110	168	354	308	65	95	6,4	14	0,3	0,04	48	304	390	162	276			
Северо-Кавказский (20)	1107	1279	624	774	348	458	92	89	99	149	31	7,2	3,5	4,5	55	274	311	226	305			
Уральский (21)	649	1045	403	532	4	—	275	262	50	57	1,5	2,1	—	—	34	255	326	97	246			
Западно-Сибирский (22)	789	1150	587	723	42	48	359	303	47	56	1	2,4	—	—	47	386	463	124	291			
Восточно-Сибирский (23)	655	618	449	365	2	—	287	248	43	45	1	1,4	—	—	41	247	290	106	218			
Дальневосточный (24)	136	235	76	75	12	—	171	188	52	63	1,6	3,0	—	0,1	22	170	182	86	242			
Украинская ССР (25)	645	861	262	438	750	1075	405	410	110	151	31	61	17	16	48	319	434	159	270			
Белорусская ССР (26)	272	639	18	42	72	129	1219	1335	77	78	19	5,0	—	—	53	410	647	115	292			
Литовская ССР (27)	364	758	55	149	154	211	769	576	98	85	25	5,7	—	—	77	610	790	160	298			
Латвийская ССР (28)	277	534	50	80	121	99	695	551	89	75	16	4,2	—	—	67	641	694	159	279			
Эстонская ССР (29)	370	771	31	91	—	—	976	788	67	67	15	3,8	—	—	78	661	792	179	325			
Грузинская ССР (30)	143	135	37	51	25	25	44	71	45	104	51	132	63	141	20	101	122	60	121			
Азербайджанская ССР (31)	123	185	79	130	—	—	24	24	47	135	14	37	19	163	17	21	85	119	66	106		
Армянская ССР (32)	99	94	57	55	47	51	75	75	73	142	23	48	55	71	18	26	149	152	83	134		
Узбекская ССР (33)	75	142	32	31	—	—	16	13	44	128	15	43	18	27	15	18	82	125	51	82		
Киргизская ССР (34)	248	375	115	176	582	417	66	71	42	94	16	48	5,3	18	37	42	164	177	70	112		
Таджикская ССР (35)	93	73	58	37	—	—	18	33	28	83	44	63	16	17	19	22	83	112	34	75		
Туркменская ССР (36)	42	89	19	22	—	—	3	5	50	90	6,3	11	16	17	26	26	74	98	35	80		
Казахская ССР (37)	1196	1827	920	1261	123	148	97	129	46	69	4,5	17	2,6	10	55	67	239	291	79	213		
Молдавская ССР (38)	638	724	175	313	541	785	87	90	125	297	74	206	228	309	39	63	180	282	113	200		

Key:

- | | | |
|-----------------------------|---------------------------------|--------------------|
| 1. Grain | 14. Including economic regions: | 27. Lithuanian SSR |
| 2. Total | 15. Northwestern | 28. Latvian SSR |
| 3. Including wheat | 16. Central | 29. Estonian SSR |
| 4. Sugar beets (industrial) | 17. Volgo-Vyatsk | 30. Georgian SSR |
| 5. Potatoes | 18. Central chernozem | 31. Azerbaijan SSR |
| 6. Vegetables | 19. Volga | 32. Armenian SSR |
| 7. Fruit and berries | 20. North Caucasus | 33. Uzbek SSR |
| 8. Grapes | 21. Urals | 34. Kirghiz SSR |
| 9. Meat (dressed weight) | 22. Western Siberian | 35. Tajik SSR |
| 10. Milk | 23. Eastern Siberian | 36. Turkmen SSR |
| 11. Eggs | 24. Far East | 37. Kazakh SSR |
| 12. USSR | 25. Ukrainian SSR | 38. Moldavian SSR |
| 13. RSFSR | 26. Belorussian SSR | |

areas of the more valuable heat-loving vegetable crops. The production of fruit and berries increased in all regions of the country. The principal increase in the production volumes for fruit and berries was realized in the southern regions of the country, especially the Moldavian SSR and Georgian SSR.

The Azerbaijan SSR, which has become one of the country's leading grape regions, is playing an increasing role with regard to raising the production of grapes in the country. During a brief period for this crop, the per capita production of grapes here increased from an annual average of 16 kilograms during the 7th Five-Year Plan to 163 during the 10th and to an average of 279 kilograms for 2 years of the 11th Five-Year Plan. Such rates of growth for production can be achieved only based upon use of the advantages offered by developed socialism.

Similar changes have taken place in rice production throughout the country. As a result of the implementation of large-scale land reclamation operations in flooded areas in the Azov Sea region and the Kzyl-Kum Tract, the north Caucasus and the Kazakh SSR have become large scale producers of rice in the country, with approximately two thirds of the all-Union production of rice concentrated here. On the average for the 1976-1980 period, 59 and 34 kilograms of rice respectively were produced here per capita annually. The per capita production of rice throughout the country as a whole during the 10th Five-Year Plan, owing mainly to these regions, amounted to an annual average of 2.8 kilograms, compared to only 0.5 kilograms during the 7th Five-Year Plan, or 5.6 times more.

Specialization in the production of meat and milk has been intensified in the Belorussian SSR, Baltic Republics and the central chernozem region of the RSFSR and in milk production -- in the western Siberian and Volgo-Vyatsk regions of the RSFSR.

The average annual per capita production of raw cotton in the country increased from 24 kilograms in 1961-1965 to 34 kilograms in 1976-1980. The growing of this valuable crop is concentrated in the republics of Central Asia, the Azerbaijan SSR and southern Kazakhstan. During the 10th Five-Year Plan, the following per capita amounts were produced annually: in Turkmenia -- 395 kg of cotton, Uzbekistan -- 353, Tajikistan -- 226, Azerbaijan -- 105, Kirghizia -- 57 and in Kazakhstan 21 kg. The principal bulk of the flax fibre is produced in Volgo-Vyatsk and the central economic regions of the RSFSR, in the Forest District of the Ukrainian SSR, in Belorussia and in Lithuania.

Thus the data cited indicates that considerable improvements have been achieved in the distribution of agricultural production throughout the country in the areas of greater regional specialization and territorial division of labor. Inter-regional exchange* allows one to make a judgment regarding the scales of this division of labor insofar as agricultural output is concerned. The

* As is known, an exchange exists in those areas where there is division of labor. On the one hand, it establishes a relationship between the various spheres of production and on the other -- between the various specialized regions.

volume of transport operations for agricultural products and the products of industry engaged in the processing of agricultural raw materials serves as an indirect indicator of this. Thus, for example, in 1981 140.7 million tons of grain freight were shipped by rail, sea transport -- 11 million and river transport -- 6.7 million tons (see "National Economy of the USSR 1922-1984," pp 328, 331 and 334). Each year, millions of tons of heat-loving vegetables, fruit and berries, in fresh and processed form, are shipped from the country's southern regions to the central and northern regions.

The modern level of development of the productive forces of agriculture and other branches of the agroindustrial complex has made it possible to convert over to a new stage, from the standpoint of quality, in solving the problem of efficient distribution and regional specialization in agriculture. The conditions of this stage are characterized by an increase in the country's population, by considerable improvements in its territorial distribution and by higher rates of growth in the urban population compared to its overall size. Thus, during the 1959-1982 period, the country's population increased by 29 percent, whereas in the republics of Central Asia and the Kazakh SSR -- by almost twofold and in the Trans-Caucasus Republics -- by a factor of almost 1.5. The proportions for the mentioned regions compared to the overall size of the population increased respectively from 11 to 16.2 percent and from 4.55 to 5.4 percent and their proportions with regard to the overall increase in the country's population during the mentioned period were 32.7 and 8.5 percent respectively. Of regions in the RSFSR, the highest increases in the population were observed in the Far Eastern, east Siberian, northwestern and north Caucasus economic regions. Accordingly, substantial changes took place in the geography of consumption of food products and other products of agricultural origin.

During the 1959-1982 period, for the country as a whole, the urban population increased by 71.7 million individuals and the size of the rural population decreased by 11.7 million. At the same time, during the period under review the size of the rural population in the RSFSR, the Ukraine, the Baltic Republics and Belorussia decreased by 21.9 million, in the republics of Central Asia and Kazakhstan it increased by 8.8 million and in the Trans-Caucasus Republics it increased by 1.25 million individuals. Accordingly, in those regions of the country where a reduction took place in the size of the rural population, a reduction also took place in the number of workers engaged in agricultural production on public farms. In those regions where an increase took place in the size of the rural population, an increase also took place in the number of workers engaged in public agriculture.

The great changes that have taken place in the size of the population, the substantial improvements in its distribution among regions of the country and the considerable growth that has taken place in the requirements of the Soviet people for more valuable food products (meat, milk, eggs, fruit and berries, vegetables and melon crops) and for industrial products of agricultural origin (cotton, leather, fur, woolen items and so forth) are confronting agriculture and other branches of the agroindustrial complex with new and more responsible tasks. From an economic and political standpoint, the party considers the Food Problem to be the central problem of the current decade.

On the other hand -- the rural areas have a powerful logistical base at their disposal today. During the period following the March (1965) Plenum of the CPSU Central Committee, the fixed capital in agriculture increased fourfold, the power-worker ratio and deliveries of mineral fertilizers -- by a factor of more than 3 and the areas of reclaimed land -- by a factor of 1.7. At the beginning of 1982, there were 2,953,000 tractors, 741,000 grain harvesting combines, 1,653,000 trucks and many hundreds of thousands of other types of machines and equipment in agriculture, the power engineering capabilities of agriculture amounted to 632.8 million horsepower, the power capabilities of engines and electrical units -- 134.4 million horsepower; the area of irrigated land exceeded 18 million hectares and that for drained land -- 8.9 million hectares. In 1981, agriculture was supplied with 19.2 million tons of mineral fertilizers (in a conversion for 100 percent nutrients) and 113.9 billion kilowatt-hours of electric power were consumed in the branch. The logistical base for other branches of the agroindustrial complex has been strengthened considerably. Thus the fixed industrial-productive capital of the food industry increased by twofold during the 1970-1981 period, the milling-groats and mixed feed industry -- by a factor of 3.3. A substantial increase has taken place in the country's network of highways. At the beginning of 1982 the overall length of hard surface automobile highways was 977,000 kilometers (more than two times greater than the figure for 1965) and the operational length of railroads -- 240,000 kilometers.

For the period up to 1990, the USSR Food program approved by the May (1982) Plenum of the CPSU Central Committee calls for further development of the logistical base for the agroindustrial complex. During the decade, the plans call for agriculture to be supplied with 3.74-3.78 million tractors, not less than 100,000 excavators, 215,000 bulldozers, 93,000 scrapers, 13,000 powered graders, 1.17 million grain harvesting combines and other agricultural machines, for a total value of 67-70 billion rubles. Roughly 15-17 billion rubles worth of technological equipment is being allocated for the food branches of industry.

In 1990 the use of electric power by agriculture will amount to 210-235 billion kilowatt-hours and mineral fertilizer deliveries -- 30-32 million tons (in a conversion for 100 percent nutrients). The plans call for the area of irrigated land to be increased to 23-25 million hectares and irrigated land -- to 18-19 million hectares.

For solving the most important task -- transport support for the agroindustrial complex -- the Food Program calls for agriculture to be supplied during the decade with 3-3.06 million trucks and 3-3.2 million tractor trailers, 110,000-116,000 milk trucks, 50,000-53,000 semi-trailers and 76,000-78,000 refrigeration trucks; for the MPS /Ministry of Railways/ to be allocated 29,000-30,000 refrigerated and insulated railroad cars; for roughly 130,000 kilometers of general purpose motor vehicle roads and 150,000 kilometers of intra-farm roads to be built in the rural areas.

In a report delivered by Comrade M.S. Gorbachev during a ceremonial meeting in Moscow, dedicated to the 113th anniversary of V.I. Lenin's birth, the following statement was made: "The Central Committee has defined the problem as follows: all plans outlined during the May Plenum for the rural areas --

capital investments, equipment, chemical agents and other material resources -- must be carried out in an unconditional manner. At the same time, as emphasized in a speech delivered by Comrade Yu.V. Andropov during a meeting in the CPSU Central Committee, more responsibility must be displayed by kolkhoz and sovkhos workers and all enterprises of the agroindustrial complex for achieving decisive improvements in the use of the existing logistical base and of the tremendous funds and resources being made available by the state. Fewer references to the weather and to so-called objective factors and more concern for proper tending of the land and a more strict and zealous approach in the use of machines, fertilizers, irrigated areas, feed financial resources and all production reserves. Greater concern for raising the cropping power of fields and the productivity of farms. This is what we require most of all at the present time." This will serve to guarantee the successful implementation of the Food Program.

Specific tasks have been set forth in the Food Program with regard to the production of the principal types of food goods for the country as a whole and for all Union republics and regions of the RSFSR.

For more complete satisfaction of the population's requirements for full-value food products and industry for agricultural raw materials, the plans for the current decade call for a substantial change in the structure for agricultural production throughout the country as a whole and in its individual regions. In this regard, the Food Program calls for different rates of growth for the principal types of agricultural products and by individual regions. Thus, compared to the level achieved during the 10th Five-Year Plan, grain production in the USSR during the 12th Five-Year Plan will increase by 22-24 percent (in the process, by 1990 the production of corn grain will increase by more than twofold and pulse crops -- by almost threefold), meat -- by 35-38, milk -- by 12-14, potatoes -- by 9-11, sugar beets -- by 15-16, sunflower seed -- by 36-41 percent, soybeans -- by a factor of 4.2-4.4, vegetables and melon crops -- by 41-48 percent, fruit and berries -- by 46-56 percent and grapes -- by a factor of 1.8-2. During this same period, the increase in grain production in the RSFSR and the Ukrainian SSR will amount to 23-25 percent, Kazakhstan -- 11-15, the Trans-Caucasus Republics -- 7-9, the republics of Central Asia -- 32-40 and the Baltic Republics and the Belorussian SSR -- 36-45 percent. Meat production in the RSFSR and the Ukrainian SSR will increase by 33-36 percent, in the Baltic economic region and Belorussia -- by 27-34 percent, in Kazakhstan -- by 39, in the Trans-Caucasus economic region -- by 47-51 and in the Central Asian economic region -- by 60-67 percent. Accordingly the production of milk in the RSFSR and the Ukrainian SSR will increase by 10-12, in the Baltic region and Belorussia -- by 10-13, in Kazakhstan -- by 21-23, in the Trans-Caucasus region -- by 29-32 and in the Central Asian region -- by 53-55 percent. Grape production in Turkmenia will increase by a factor of 5.4, Azerbaijan -- by 2.3-2.5, Georgia -- by twofold, Armenia and Moldavia -- by 1.4-1.5, the Ukraine -- by 1.8, RSFSR -- by 2.6, Uzbekistan -- by threefold and in Tajikistan -- by a factor of 2; fruit and berries -- in Moldavia -- by a factor of 2.7-3, Uzbekistan -- by 1.8, the RSFSR and the Ukraine -- by a factor of 1.4; vegetables and melon crops -- in the Trans-Caucasus Republics -- by 45-51 percent, Kazakhstan -- by a factor of 1.9 and in the republics of Central Asia -- by a factor of 2.1 (see USSR Food Program for the Period up to 1990. Moscow, 1982, pp 32-35 and 63-73).

The Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up To 1990 call for further growth in the production of cotton, flax, wool and karakul pelts in the principal regions in which they are grown and produced and for improvements in the quality of these types of products.

Growth in the production of animal husbandry products in the various regions will be achieved through the further development of feed production. The plans call for the production of all types of feed to be increased during the decade as follows: in the RSFSR, the Ukrainian SSR, the Baltic Republics, Belorussia and Armenia by a factor of 1.3-1.4, Moldavian SSR -- by 1.4-1.5, Kazakhstan, Kirghizia, Tajikistan and Turkmenia -- by 1.5-1.6, Georgia -- by 1.6-1.7 and in Azerbaijan and Uzbekistan -- by a factor of 1.8-2. In the interest of efficient use of forage grain, the program calls for measures aimed at increasing the production of mixed feed. Tasks have been established for increasing the production of rich protein-vitamin additives, nutrients, fodder lysine and feed of animal origin.

The higher rates of growth for grain production in the Baltic Republics, Central Asia and Belorussia are making it possible to raise the level of their support in the form of grain forage. A considerable increase in the production of meat and milk in the Trans-Caucasus and Central Asian Republics, Kazakhstan and Moldavia will aid in satisfying the increasing requirements of the local population for these products. The southern regions of the country are being converted into the principal base for supplying the population of the center and the north European part of the country, the Urals, Siberia and the Far East with heat-loving vegetable, fruit and berry crops. The population's demand for potatoes, late vegetable products and also late fruit and berry crops must be satisfied mainly through their production in the consumption regions.

At the same time, during the May (1982) Plenum of the CPSU Central Committee it was noted that the specific indicators for the production of particular types of food products, as set forth in the Food Program, should be considered as minimal in nature. The task of the republics and regions consists not only of fulfilling these indicators but also of over-fulfilling them and thus making a real contribution towards the important work of continuously supplying our Soviet people with food goods.

Studies that have been carried out and the leading experience that has been accumulated testify to the considerable potential that is available in all regions of the country for increasing the production of agricultural products. Here we have in mind the existing opportunities for raising the efficiency of use of land, mainly reclaimed and natural feed lands, for improving and achieving more complete use of organic and mineral fertilizers, labor resources and other resources in agriculture and for developing scientifically sound crop rotation plans and improving the structure of agricultural production in conformity with the natural-economic conditions and, on this basis, raising the agricultural crop yields and livestock productivity.

Thus, for example, the productivity of the milking herd in the Trans-Caucasus Republics, Central Asia and Kazakhstan continues to remain low. At the same time, there are many farms here which over a period of many years have been obtaining 3,500 to 4,000 kilograms of milk or more per cow. In the Azerbaijan SSR, grain and forage crops are being grown on 540,000-550,000 hectares of

reclaimed land (more than 60 percent of the sowing area) and yet the yields are extremely low. On the average for the 1976-1980 period, only 19.2 quintals of grain corn, 85 quintals of corn for silage and green feed and 88 quintals of root crops were obtained per hectare of irrigated land (see *EKONOMIKA SEL'SKOGO KHOZYAYSTVA*, 1983, No 4, p 44). In Amur Oblast, one of the country's main soybean production regions, the average yield obtained during 1981-1982, under unfavorable weather conditions, was 6.5 quintals per hectare. At the same time, last year the Pogradichnik Sovkhoz obtained 15.1 quintals of soybeans from each of 6,600 hectares and the brigade headed by I. Petrov at this same sovkhoz obtained 19.5 quintals of soybeans from each of 1,750 hectares. At an OPKh /experimental model farm/ of the All-Russian Scientific Research Institute of Soybeans, the average yield for this crop was 16.5 quintals per hectare, while at the Partizan Sovkhoz a yield of 15 quintals of soybeans per hectare was obtained from more than 7,000 hectares (see *SEL'SKAYA ZHIZN'* 11 February 1983; *IZVESTIYA*, 28 April 1983).

The agricultural workers in the Uzbek SSR have made a fine start. During 2 years of the current five-year plan, 270,000 tons of cotton were delivered over and above the figure called for in the plan; compared to the average annual level for the 10th Five-Year Plan, grain production at kolkhozes and goskhozes increased by 27 percent, vegetables -- by 20, fruit and grapes -- by 30 percent, potatoes -- by a factor of 1.8; meat production at all categories of farms increased by 25 percent, milk -- by 20 and eggs -- by 27 percent. The February 1983 Plenum of the Central Committee of the Communist Party of Uzbekistan assigned the task of increasing the production of meat and eggs in 1985, at all categories of farms, by a factor of 1.5 above the figure for 1982, milk -- by 1.4 and feed -- by a factor of 1.7; to increase the feed yield per hectare to 8,500 feed units (see *PRAVDA VOSTOKA*, 9 February 1983).

When solving the problems of agricultural production, one should bear in mind our country's limitations in terms of territories having very favorable natural conditions and the need for utilizing them in an efficient manner. A quantitative expression for the productivity of natural lands is provided by the BKP /bioklimaticheskiy potentsial; bioclimatic potential/, which according to data obtained from studies by P.I. Koloskov and D.I. Shashko, can be expressed by the formula:

$$BKP = K_p \frac{\sum t^{\circ} < 10^{\circ}}{1000^{\circ}}$$

where K_p -- is the coefficient of biological productivity for plants, associated with the moisture conditions, which is determined by the total amount of precipitation and the conditions for its evaporation; 1000° -- is the total amount of temperatures for the northern border of field farming.

For a number of heat and moisture loving crops -- corn, soybeans, winter rape, sugar beets -- the average data accumulated over a period of many years at state strain testing stations reveals a direct and close to linear dependence of yields upon the BKP value.

Computations carried out at VNIIESKh /All-Union Scientific Research Institute of Agricultural Economics/, in accordance with data supplied by GIZR /Gosudarstvennyy institut Zemel'nykh resursov; State Institute of Land Resources/, reveal that approximately 23 percent of the country's arable land

is located in regions having more favorable bioclimatic conditions, with a BKP value of more than 2.2. Thus it is obvious that this territory should ideally be utilized as much as possible for crops -- sources of deficit products -- which utilize the BKP more completely. Thus, according to computations by V.A. Smirnova, grain corn in Odessa Oblast utilizes 100 percent of the BKP (the ratio of the BKP for the crop to the BKP for the terrain), winter wheat only 52 percent and spring barley -- 70 percent.

Computations indicate that within the limits of sufficiently favorable zones, taking into account the area requirements for the cultivation of other crops, the corn grain area can be expanded by a factor of 2.2 and soybeans by twofold. When analyzing regional agricultural development and substantiating the changes in production distribution, one should obviously take into account the existing and planned utilization of the bioclimatic potential and the support for it in the form of resources. For example, computations carried out on the basis of GIZR data reveal that for a conversion for 1 hectare of comparable agricultural land in the north Caucasus economic region of the RSFSR and the Ukrainian SSR, which are characterized by an extremely high bioclimatic potential, the relative support in the form of fertilizers and fixed capital is lower than the average union level.

On the average for the 1976-1980 period, in a conversion for 100 hectares of comparable arable land, the deliveries of fertilizers to the north Caucasus economic region amounted to 60 percent of the average level for the country and the value of the fixed productive capital of an agricultural nature, per 100 hectares of comparable agricultural land (excluding perennial plantings) -- 95 percent. In the Ukrainian SSR, these values amounted to 53 and 75 percent respectively.

The relatively insufficient resource support in the sense that full use was not made of the potential for developing those crops which utilize the BKP more completely could explain why the output of field crop husbandry, in a conversion for 1 hectare of arable land during the 10th Five-Year Plan, in the north Caucasus economic region and in a conversion for standard grain units*, amounted to 86.9 percent and in the Ukrainian SSR -- 91.2 percent of the average for the USSR and for 1 hectare of comparable agricultural land -- 95 and 75 percent respectively.

Included among the vital problems associated with the territorial division of labor in agriculture is further development of intra-regional and inter-regional relationships in deliveries of the output of the agroindustrial complex. These relationships must be of both a bilateral and multilateral nature. The expansion of contacts with regard to mutual deliveries of potatoes between the northern and southern regions offers considerable prospects for the future: early potatoes from the southern to the northern regions and late potatoes and seed from the northern to the southern regions. Shipments from the southern to the northern part of the republic of early vegetables and the products of late heat-loving crops and from the north to the south of cold-resistant vegetable crops and potatoes, as recommended by the Kazakh Scientific

* The conversion into standard grain units is carried out using coefficients which correspond to the average production cost for products at USSR sovkhozes in 1978.

Research Institute of Economics and Agricultural Organization, can serve as an example of intra-regional bilateral relationships.

However the resources of regions having conditions which are uniquely favorable for the production of definite crops must be used not for bilateral but rather for multilateral relationships.

Thus the Central Asian republics have the most favorable natural conditions in the country at their disposal for the production of table and raisin varieties of grapes which are distinguished by a high sugar content, fruit for consumption in both fresh and dry form, melons and watermelons. If more suitable transport arrangements are available between the Central Asian economic region and western Siberia than with other regions, then the deliveries of its fruit, vegetable and melon products must not be limited to this region but rather must be distributed to the Urals, the central and a number of other regions throughout the country. On the other hand, computations have shown that western Siberia, in the foreseeable future and taking into account the need for meeting the requirements of eastern Siberia and the Far East, cannot satisfy those requirements of the Central Asian republics for transportable meat and dairy products which are not being covered by local production. This task can only be solved by using the resources of a number of republics and economic regions specializing in the production of animal husbandry products: Belorussian SSR, Baltic economic region and others.

The territorial relationships require further development not only in terms of deliveries of food goods and raw materials to industrial but also with regard to ensuring the reproduction process in agricultural production. These relationships are found most often in poultry raising where, within the USSR Ptitseprom [Poultry Raising Industry Administration], pedigree eggs are delivered on a regular basis from the Baltic Republics to the Central Asian Republics for the purpose of accelerating there the development of highly productive poultry operations, with the requirements of poultry factories in the northern regions of the country for day-old young stock being satisfied in a systematic manner. Inter-regional and intra-regional relationships with regard to the production of seed for corn, perennial grasses and vegetable crops in zones having the most favorable conditions have definitely been developed, with these zones satisfying the requirements of other regions. For example, an all-union base for beet seed production is being created in the Kirghiz SSR and also one for hybrid sunflower seed in the Moldavian SSR. These relationships must be more stable and call for the formation, in the appropriate regions and zones, of reserve seed stocks in the interest of ensuring fulfillment of the contractual obligations for deliveries to other regions.

An increase is taking place in the requirement for stable territorial-production relationships between farms in the northern regions with enterprises in other zones of the country, where in the face of limited opportunities for feed production there is a need for a concentration of highly productive dairy cattle in the vicinity of dairy centers. Thus, at the Tuloma Sovkhoz in Murmansk Oblast, which has approximately 1,100 hectares of agricultural land that are being used entirely for feed purposes, the milking herd is being supplied only with green feed that is internally produced. The

entire volume not only of concentrated but also of coarse (hay, straw) and succulent feed is being imported from other regions of the country. A need arises at sovkhoses having similar production relationships in connection with the creation of a food base for rapidly growing industrial centers in the BAM /Baykal-Amur Trunkline/ Zone and for other territorial-production complexes in Siberia and the Far East.

In this regard, support and further development should be given to the recommendations by the Siberian Scientific Research Institute of Agricultural Economics concerning the creation, for the purpose of satisfying the production requirements for feed and replacement young stock of farms in the BAM Zone and other regions having unfavorable conditions for agriculture, of a system of specialized enterprises in "rear bases," in regions having more favorable natural conditions.

The need for solving the task of territorial division of labor in cattle husbandry based upon production cooperation is becoming more urgent. There are two principal types of products in this branch -- milk and cattle intended for meat purposes and for reproduction of the herd are not equally transportable. In this regard, there should be maximum production concentration for the difficult to transport product -- milk -- in the vicinity of large cities, in the zones for butter-making, cheese-making and the milk canning industry and, when possible, for the raising and fattening of cattle in other zones.

Meanwhile, with the exception of beet growing and potato processing regions, where the fattening of cattle is being carried out based upon pulp residue, malt residue and vegetable pulp in the vicinity of sugar, alcohol and starch-syrup plants, in the principal zones for the production and processing of milk, the obtaining, maturing and fattening of young stock are being carried out as a rule within the confines of the same administrative rayon. This leads to inefficient use of the feed area of suburban regions for the purpose of increasing the live weight of the cattle, to an excessive increase in the extent of the raw material zones for butter-making, cheese-making and milk canning industry and to a corresponding increase in the milk shipment radiuses. Thus, in the central economic regions of the RSFSR, according to accounting data for sovkhoses in this region, of the overall quantity of feed consumed in cattle husbandry in 1980, approximately 55 percent was used for obtaining milk and 45 percent for obtaining weight increases in the cattle. In this regard, a need has arisen for permanent production relationships, conditioned by plans and agreements, between specialized dairy farms in some zones and enterprises for the maturing and fattening of animals -- in others. In particular, zones for intensive feed production on irrigated lands in the Volga region may become a large specialized region for the raising and fattening of cattle imported from other regions.

A scientific and practical solution for these problems will make a substantial contribution towards increasing and raising efficiency in the production of agricultural products, as called for in the Food Program.

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AGRO-ECONOMICS AND ORGANIZATION

DEVELOPMENT, PROSPECTS OF SUBSIDIARY INDUSTRIAL ENTERPRISES DISCUSSED

Moscow ZHURNALIST in Russian No 6, Jun 83 pp 34-36

/Article by Oleg Nikolayevich Artynskiy*: "The Way Is Open"/

/Text/ I arrived at the Pervomayskiy settlement, which is in the heart of Smolensk Oblast, at the beginning of 1978.

I would have not mentioned the date, but it is highly significant for these notes. At that time subsidiary farms of enterprises just began to make themselves known. Meanwhile, as Smolensk journalists reported to the editorial board of EKONOMICHESKAYA GAZETA, a subsidiary farm, which fully provided the enterprise collective with meat, milk and vegetables, was established at the Pervomayskiy Glass Plant. It had to be clarified in what way success was achieved there and on what basis the agricultural shop operated.

On my arrival I got acquainted with Nikolay Iosifovich Shugarov, director of the plant. As I was told, the subsidiary farm was built on his initiative.

At that time this venture was not only new, but risky as well. There were no directives on it "from above," which meant that one had to explain to the regular auditor at the expense of what funds, for example, the hog section would be kept, by what method the plant built the dairy complex and the hothouse and, most important of all, whether basic production did not suffer from this.

N. Shugarov patiently explained, quarreled and wore out his nerves. But this did not bother him. With documents in his hands he demonstrated to auditors that no legal violations were committed during the acquisition of the plant's own agricultural shop and that profits from it already began to cover expenses.

It was much more difficult to solve the economic problems facing the agricultural shop. For example, in order not to lay out meadows and arable land on the plant territory, land was needed. It was available, but it was marginal

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and water-logged. People were taken by the idea of developing it, machinery was also available at the plant, but reclamation specialists were needed. And what about agricultural equipment, mineral fertilizers and seeds? Everything was assigned to kolkhozes and sovkhoses. The rayon party committee and the rayon executive committee helped.

Very well. Things began to move and advance. Consequently, people familiar with peasant labor were needed. Since the Pervomayskiy settlement was located in a rural area, there was no shortage of people who knew how to plow, sow, harvest and take care of livestock at the plant. However, the growing agricultural shop also required skilled specialists--agronomists and zootechnicians.

In brief, when I arrived at Pervomayskiy, a great deal had already been solved. However, a lot of unsolved problems remained. The party and government decree "On Subsidiary Farms of Enterprises, Organizations and Institutions" was issued in the same year of 1978 and it became clear that N. Shugarov correctly understood the needs of the time and acted properly. The obstacles that the people of Pervomayskiy had to overcome with great difficulty were eliminated to a significant degree. The decree stated clearly: Subsidiary farms must be given all possible help by local bodies, ministries and departments. Specifically, land from state land and forest resources, as well as unutilized land, must be allocated to enterprises. The USSR Ministry of Agriculture, the USSR Ministry of Procurement and the USSR State Committee for Supply of Production Equipment for Agriculture must provide subsidiary farms with varietal seeds, planting stock and young pedigree livestock and, beginning in 1980, with the necessary equipment, spare parts, mineral fertilizers and other material and technical resources.

It was also envisaged that ministries and departments could earmark capital investments for the development of subsidiary farms from their own funds and allocations. Furthermore, the All-Union Bank for Financing Capital Investments and the USSR State Bank were permitted to grant credits for the organization and development of agricultural shops for 6 years and, what was very important, these credits could be given in excess of the volumes of state capital investments.

Later, in 1980, another decree was issued. It specified and expanded the possibilities and rights of local bodies and councils of ministers of republics for helping subsidiary farms. It was noted that, as an exception, the land of economically weak kolkhozes and sovkhoses could be transferred to enterprises.

Thus, these two documents explained in detail what enterprises should do during the establishment of subsidiary farms, how their relations with local bodies, ministries and departments should be built and who should help the development of subsidiary farms and in what way.

Seemingly, everything is clear now. However, last year I read the report "Firm and Farm" published in SOVETSKAYA ESTONIYA and it was as though I returned to the Pervomayskiy settlement during the days when N. Shugarov and his associates started the new enterprise at their own risk.

What is discussed in this report? An order was given to establish "micro-farms" for 8, 10, 24 and even 26 (!) hogs in terms of 1 hog per ... 100 people (?) at the mines of the Estonslanets Association. The authors correctly criticize the association's managers for their showing off: They now have their own model farms for reports, but it is not important how much output they will give. The chief thing is that it is available and losses--moral and material--will be covered by an organizational commotion.

However, while fighting against the obvious bungling and urging not to split the agricultural shop into small primitive subdivisions, journalists describe the difficulties confronting, in their opinion, the Estonslanets Association: One big farm could be established, but where to get land, feed, equipment and fertilizers, how to acquire specialists and so forth. As though there are no well-known decrees and it is 1978, the year when the problems enumerated by the authors were fully legitimate, at the yard. Thus, voluntarily or not the report "Firm and Farm" justifies the lack of initiative on the part of those criticized, who, as I believe, suggested the idea of insurmountability of the allegedly objective factors to journalists.

I recall the talk with N. Shugarov, when I visited him for the second time after the decree (1978) of the CPSU Central Committee and the USSR Council of Ministers on the development of subsidiary farms. At that time the director of the glass plant was already famous. Many articles on his initiative appeared in the local and central press. However, one could sense that they did not make Nikolay Iosifovich especially happy. In his opinion, it would have been more useful for newspapermen to write not about how subsidiary farming was established under the old conditions, but why under the new conditions few enterprise managers decide to acquire their own rural shop. Obviously, personal initiative and a state approach to this matter in the localities are needed.

As if to confirm these statements by N. Shugarov, a report by A. Shevtsov, our own correspondent in Leningrad, on the subsidiary farm of the Leningrad Optics and Mechanics Association (LOMO) was published in EKONOMICHESKAYA GAZETA in the middle of 1978. Unlike the Pervomayskiy Plant this association is vast. It has enough purely industrial problems, which, however, does not prevent its collective from being an advanced collective. Yet Mikhail Panfilovich Panfilov, its general director, Hero of Socialist Labor, winner of the Lenin and State prizes, deputy of the USSR Supreme Soviet, visits the subsidiary rural shop of this enterprise every week, mostly on Saturdays. He inspects all the facilities, talks with workers and vacationers (LOMO workers have their own rest base here) and then leaves a list of jobs that must be done first without fail with every specialist of the agricultural shop. It turns out that both Shugarov and Panfilov hold the same views on the approach to the organization of rural subsidiary shops and of their personal management.

There are thousands of such giants as LOMO in the country, but the attitude of their managers toward this matter is quite different. PRAVDA correspondent V. Lisin in an article on subsidiary farms of enterprises in Tyumen writes the following: "Analyzing the state of affairs with subsidiary farms in the oblast, one arrives at the conclusion that in many respects they are still ventures of enthusiasts." This article was published in ... 1982.

A. Sokolov, chairman of the Irkutsk Oblast Executive Committee, wrote the following in IZVESTIYA: "A total of 217 big and small subsidiary farms operate in the oblast. However, such an industrial giant as the Irkutsk Aviation Plant is not among the leaders in the production of agricultural products, because in no way will it overcome its inertia." Here is another example: A total of 12,000 hectares of land have been allocated to the Bratskiy Timber Complex Association and to the aluminum plant, but for the time being they have put to use only 1,500 hectares.

You see, the question as to where to get land has not been raised for a long time. It is formulated differently: Why is the land allocated to an enterprise not developed? Judging from the data of the USSR Ministry of Agriculture, the transfer of land to subsidiary farms is now proceeding as an avalanche. This is the answer given to our weekly by A. Zavgorodniy, deputy chief of the Main Administration of Interfarm Cooperation and Agroindustrial Integration of Sovkhoz and Kolkhoz Production of the USSR Ministry of Agriculture: "In 1981 alone ministries and departments established 3,500 farms. They were granted land plots of a total area of 1.6 million hectares, including 1.2 million hectares of agricultural land. A total of 2.9 million hectares of agricultural land (including 1.1 million hectares of arable land) were assigned to subsidiary farms of enterprises and institutions at the beginning of 1982."

In brief, land is available. Where its development is undertaken in a thought out manner, there are results. Be that as it may, industrial enterprises have available both highly skilled personnel and a powerful technical base. Therefore, help for the new rural shop is quick and efficient. Shugarov in Pervomayskiy--even though it is a glass plant--has his own machine shop, design group, electricians, sanitary engineers and mechanics. Therefore, on the subsidiary farm one milkmaid without the application of manual labor services as many cows as on the rayon's specialized farm. Moreover, the weight gains of animals and milk yields from cows are higher than the average in the rayon. In LOMO plant experts introduced various mechanisms at sections and installed electronic counters for milk recording, which does not exist even on the country's leading specialized farms.

A. Nikitin's report "Subsidiary or Under Patronage?" was published in LITERATURNAYA GAZETA. The author notes the following in it: "Independence, initiative and interest in the end product--this is the trump card of subsidiary farms in the secret competition with kolkhozes and sovkhozes. At times they do not even have sufficient agrarian competence. On the other hand, they more boldly transfer the industrial and plant method of work to land and to the livestock yard. P. Ivatanov, chief of the workers' supply administration of the coal basin near Moscow, told me about his remarkable subsidiary Donskoy Sovkhoz. The average harvests are 25 to 30 percent higher than in the oblast. Basically, livestock is provided with local feed. One-half of the 3,000 hogs available here are concentrated in a wonder-hog house, which is serviced by... two people."

However, the conversation again turns to some positive examples and diligent enterprise managers, who conscientiously try to utilize the advantages of agroindustrial integration. Unfortunately, the picture is by no means so

cheerful throughout the country. I was told in the USSR State Planning Committee that there were more than 16,000 subsidiary farms in the country, but they produced only... about 1 percent of the gross agricultural output. This is some news! Quantitatively, subsidiary farms have almost caught up with sovkhoses (there are more than 20,000 sovkhoses in the country), the industry transfers industrial methods of labor to its agricultural shops, but the results are so modest! Why?

The contradiction is apparent. The point is that subsidiary farms arise on a mass basis, but they are not uniform. Recently, the USSR Central Statistical Administration developed a special form of reporting, according to which 53 Union and Union-republic ministries and departments provided information for last year. Subsidiary farms having several animals, for example, hogs, modern fattening complexes requiring mixed feed plants and reproducers for the breeding of young stock and, finally, arable land under a set of the necessary fodder crops are entered in the enterprise's form of reporting. In brief, specialists admit that subsidiary farms at times incomparable in size are taken into account in the same manner. A. Sokolov, chairman of the Irkutsk Oblast Executive Committee, notes that in the oblast "the total number of subsidiary farms includes, for example, such subsidiary farms as the one at the Tulun Confectionery Factory, where there are only... five hogs."

Cooperative workers have especially many small subsidiary agricultural shops. There are more than 8,000 subsidiary farms in the system of the USSR Central Union of Consumer Cooperatives. This represents one-half of their total number in the country. All these small farms must be developed, placed on a modern basis and provided with local feed, utilizing primarily local resources for this. Judging from publications, this is not always the case in practice.

Two years ago I had occasion to examine the complicated history of establishment of a subsidiary farm by the workers of the Penza Oblast Administration of Public Dining and of some industrial enterprises. The fattening complex built there was modern in all respects: Plans were made to fatten 28,000 young hogs weighing 35 to 40 kg up to the delivery weight of 105 or 106 kg in 6 months and then to establish a new batch. This means, 56,000 head in a year. All the basic operations connected with the care of animals were mechanized and automated.

The complex was built quickly. The administration's workers took a loan for construction in the State Bank and the city's industrial enterprises sent people for the construction of this complex and allocated building materials and equipment. Work proceeded according to schedule and the complex was put into operation almost without delays. Then rough days followed. There was a shortage of feed and animals and places in the fattening house were empty.

Everything was simple on paper: Food waste should occupy 60 percent in the ration of animals and concentrates, 40 percent. In fact, however, food waste was received only from public dining enterprises, but no one thought in advance about collecting food waste from the population, which is the main reserve. While the appropriate cost accounting office was being established and while it was being put into effect, the deficiency of waste was compensated by concentrated feed. It was bought from the state. This means that what the complex received, kolkhozes and sovkhoses failed to receive.

There was also a lack of coordination with the planned stock. Building the complex, the workers of the Penza Oblast Administration of Public Dining decided to do without a shop for the reproduction of young stock, saying that it was simpler to buy young hogs on the oblast's farms. However, kolkhozes and sovkhoses hardly coped with meat deliveries according to the state plan and did not want to sell young hogs "on the side."

G. Robustov, director of the complex, led me through shops and showed me the latest equipment, which enabled, for example, one operator to take care of 2,000 animals. However, the director's voice was not happy. The empty boxes did not gladden his eyes, nor did the daily concerns about where to obtain feed raise his spirits.

True, the office for the collection of food waste from the population operated increasingly better and a decision to establish a local feed base was also adopted. However, this required more than 6,000 hectares of arable land in one tract next to the subsidiary farm. For the time being, however, it was not possible to get hold of the necessary hectares even in different rayons in the oblast.

The oblast executive committee understood that the scattered land doomed this venture to failure in advance. It saw another, the only sound, way: To transfer the poorly developed land of economically weak farms to the complex. However, as stated above, this was permitted only by the 1980 decree. Incidentally, the Penza Complex received the necessary land and henceforth was able to develop successfully.

I am discussing Penza's history, because its lesson is not obsolete even today. Under the new conditions that have given "green light" to agricultural shops of enterprises there is still a great deal of haste and many unconsidered decisions are made, for which at times one must pay. Often enterprise managers rush to establish a supersubsidiary farm without a preliminary economic study and without a coordination of all organizational problems. This is the main reason for the many failures in the establishment of agricultural shops and for their economic instability.

I recall a conversation in the subdivision of sovkhoses of the USSR State Planning Committee. Here it is believed that the matter of establishment of subsidiary farms is only undermined if their structure, staffs and problems of material and technical provision are not thought out in advance and in detail in the localities. A subsidiary farm must give a real return from the first day of operation. I would like to add that the workers of the subdivision of the USSR State Planning Committee expressed the opinion that the future belongs to agricultural shops established with the share participation of several enterprises. It turns out that the workers of the Penza Oblast Administration of Public Dining were on the right track, but they themselves created many complications for themselves...

I will not take the risk of subscribing without any reservation to the statement that the "Penza variant" (without errors, of course) is the most promising. Whether subsidiary farms are built on a share basis or with the funds of one enterprise and whether they differ in their scale or not, it is important for all of them without exception to be profitable, not to burden the state with requests and demands and, first of all, to utilize local resources.

I, for example, do not know whether the hothouse established at the Truskavets Wholesale-Retail Fruit and Vegetable Combine can be called a subsidiary farm. Its duty is to supply the health resort-city with fruits and vegetables. However, as at any enterprise dealing with such delicate products, there is waste at this combine. It is sold for livestock feed to suburban kolkhozes and sovkhozes. However, not all of it. Onion waste is sorted out carefully and rotten onion heads are cleaned and planted in the hothouse. Commercial bunch onion is obtained in 2 weeks. Thus, up to 35,000 tons of products are saved annually. This represents a profit for the combine and a weighty addition to the city dwellers' table. And all this is in a narrow strip of land near a blank wall of a processing shop enclosed by glass frames.

I repeat, no matter what forms agricultural shops of enterprises assume next, there certainly must be profit from them. Otherwise, this venture is expensive for enterprises, which means for the state as well.

In my opinion, this should be the reference point during an elucidation in the press of the formation and development of subsidiary farms, which, as was stated at the April conference of the first secretaries of the central committees of the communist parties of the Union republics and of kray and oblast party committees, "can and should" become "a big help in the supply of foodstuffs for labor collectives."

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AGRO-ECONOMICS AND ORGANIZATION

PROCUREMENT PRICE MARKUPS ON LIVESTOCK, CROPS IN KAZAKHSTAN ANALYZED

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 7, Jul 83 pp 29-31

[Article by Ye. Sembin, head, department of costs and prices, Kazakh Scientific Research Institute of Agricultural Economics and Organization, and B. Omarov, economist: "Procurement Price Markups as an Incentive Measure"]

[Text] Improvement in product quality is one of the most important factors in increasing the efficiency of our agricultural production. Playing a role of no small importance in the program of measures affecting quality is the product purchase price, as well as the scale of discounts and markups based upon grade and category. It is thus as though an enterprise is advanced a certain amount for increased production of produce of specific types and qualities.

This article will be discussing the role procurement price markups play in both beef cattle husbandry and crop production. They are not only increasing farm profits, they are also giving them a stake in overfulfilling planned procurement targets.

For example, two-year-old bulls with a live weight of at least 300 kg received from kolkhozes, sovkhoses and other agricultural enterprises and associations will bring the same price as cattle which have been fattened longer if they measure up to standard requirements in all other categories. Procurement price markups of 35 and 50 per cent are in place in all parts of the republic for young animals in the higher weight categories. The former amount is paid for bulls weighing between 350 and 400 kg, the second for bulls weighing more than 400 kg.

That these state-set procurement price markups are having a positive impact upon the quality of our livestock production is indicated by the following fact: the proportion of young cattle in high-weight categories (over 350 kg) reached 83 per cent by the end of the Tenth Five-Year-Plan period for the republic as a whole, 63 per cent accounted for by animals weighing more than 400 kg.

To trace the relationship between procurement price markups and procured product quality it will be helpful to look at a table giving the figures on young cattle turned over to the state by farms in all oblasts of the republic over the course of the Tenth Five-Year-Plan period (figures given are annual averages). See Table 1.

Table 1.

Области	Удельный вес от республиканских объемов (a)		Удельный вес бычков высшей упитанности (в %)	Среднесуточный вес 1 головы (в кг)	Выплачено надбавки на 1 т реализованной продукции (b)	
	реализация (в %)	надбавки (в %)			(в руб.)	% к действующей цене
1	2	3	4	5	6	7
По республике	100	100	68	377	254,79	19,9
а Кустанайская	139	20,8	85	416	379,97	28,9
б Уральская	71	8,3	61	395	297,69	25,9
в Северо-Казахстан.	85	9,8	68	384	293,33	22,0
г Целиноградская	89	10,1	63	389	289,21	21,4
д Кокчетавская	98	11,1	74	384	284,0	21,6
е Восточно-Казахстан.	56	5,8	63	375	262,79	22,3
ж Актыубинская	53	5,1	58	355	241,26	20,2
з Тургайская	31	2,7	58	376	222,38	16,5
и Семипалатинская	61	5,2	67	376	215,36	18,3
к Талды-Курганская	30	2,4	73	370	199,01	18,0
л Карагандинская	45	3,4	53	359	200,90	16,1
м Павлодарская	94	7,3	57	362	198,72	14,7
н Джамбулская	26	1,9	64	358	192,38	16,2
о Чимкентская	36	2,6	77	359	188,40	14,2
р Алма-Атинская	38	2,4	74	359	162,78	14,1
с Дзержинская	19	1,2	64	338	161,14	12,5

KEY: 1 - oblast; a - proportion of republic volumes; 2 - meat sales (in per cent); 3 - markups (in per cent); 4 - proportion of high-weight bulls (in per cent); 5 - average procurement weight per head (in kg); b - bonus markup paid per ton of product sold; 6 - in rubles; 7 - per cent of current price; c - republicwide; d - Kustanayskaya; e - Ural'skaya; f - Severo-Kazakhstanskaya; g - Tselinogradskaya; h - Kokchetavskaya; i - Vostochno-Kazakhstanskaya; j - Aktyubinskaya; k - Turgayskaya; l - Semipalatinskaya; m - Taldy-Kurganskaya; n - Karagandinskaya; o - Pavlodarskaya; p - Dzhambul'skaya; q - Chimkentskaya; r - Alma-Atinskaya; s - Dzhzhzhkazganskaya.

From the data shown in the table we can see the farms of which oblasts are receiving the highest bonus payments for high-weight young animals and the better-fatted livestock. Republicwide, for example, procurement price markups on the better-fatted, higher-weight older livestock and young animals over the years of the Tenth Five-Year Plan period ran to 19.9 per cent, or 254.79 rubles per ton of product sold. But while the figure on these markups for Taldy-Kurganskaya Oblast was 18 per cent and 16.2 per cent for Dzhambul'skaya Oblast, farms in Alma-Atinskaya Oblast received bonus markups of only 162.78 rubles per ton of product sold each, that is, 14 per cent, which is entirely unsatisfactory even when compared with neighboring oblasts.

The operation of the markup as an economic lever can be particularly clearly observed if we look at the situation in Taldy-Kurganskaya Oblast. Over the course of the Tenth-Five-Year-Plan period, farms here engaged in beef production turned in figures for average daily weight gain, average livestock procurement weight and proportion of young bulls in high-weight categories which exceeded average figures for the republic as a whole. Weight gain, for example, rose from 438 g in 1976 to 516 g in 1980 (or by 17 per cent), average procurement weight per head from 310 kg to 399 kg (or 28.7 per cent) and proportion of high-weight animals

40 per cent. Overall, oblast farms in 1980 received a bonus procurement price markup per ton of livestock sold of 302.44 rubles, or 26.2 per cent (the figures for the republic as a whole were 293.02 rubles, or 22.9 per cent).

Recent years have also seen improvement in the quality of cattle turned over to the state by Kazakh kolkhozes, sovkhoses and specialized rayon farms. The 1976-1981 period saw proportions of young bulls in the high-weight categories average 68 per cent; 19 per cent were average, 11 per cent below average, 2 per cent were underweight. Consistently good results in young bull-fattening programs are being achieved in Kustanayskaya Oblast. Each year sees 88-90 per cent of the cattle Kustanayskaya Oblast livestock growers send to the meat-packing combines fall into the higher-weight categories; for the growers in Kokchetavskaya and Chimkentakaya Oblasts these figures are 78-80 and 79-81 per cent respectively.

But in a number of oblasts, and even between some rayons, we are still seeing wide variations. In Severo-Kazakhstanskaya Oblast, for example, the proportions of livestock in the high-weight categories dropped from 80 per cent in 1977 to 63 per cent in 1981, in Tselinogradskaya Oblast from 73 per cent in 1978 to 67 per cent in 1981, in Ural'skaya Oblast from 68 per cent in 1977 to 51 per cent in 1981 and in Karagandinskaya Oblast from 63 per cent in 1978 to 42 per cent in 1981.

If these oblast had maintained their proportions of high-weight livestock in the neighborhood of the highest figure achieved over the course of the Tenth Five-Year-Plan period, the republic as a whole would have shown a 1980 figure of 76 per cent rather than 71 per cent. This 5 per cent would have yielded farms a profit of over 6 million rubles.

Differentiated payments in the form of bonus procurement price markups are of great importance to qualitative analysis of the economic performance of kolkhozes and sovkhoses; they invigorate their operations economically and exert a positive effect upon efforts to improve the functioning of the economic administrative system.

Our people need good-quality products. This statement applies to grain products as well as to meat and milk. Bonuses have been established for sales to the state of superior-quality wheat as well. Procurement price markups for strong wheat varieties run to 50 per cent over the price paid for soft wheat if gluten content is 32 per cent or higher, 30 per cent for a 28-31 per cent gluten content. High-value and strong grain varieties containing 25 per cent gluten and of at least second-category quality will bring a markup of 10 per cent over the price paid for soft wheat.

The introduction of procurement price markups has had a positive impact upon efforts to increase production volumes and product profitability. Of all Kazakh wheat now flowing into state graineries, over 76 per cent now comprises strong and high-value varieties.

The years of the Tenth-Five-Year-Plan period saw incentive payments for higher wheat gluten content make it possible for Kazakhstan's sovkhoses and kolkhozes to bring in an extra 1.85 rubles per quintal of wheat turned over to the state. This amounted to an increase in profitability of 27.2 per cent.

The average annual bonus for high-quality grain for the republic as a whole came to 232.2 million rubles, or 21.3 per cent of procurement price. But we see considerable variation in this figure when we look at it in terms of individual regions. When we take the primary grain-growing oblasts, for example, it ranges from 7.5 to 31.6 per cent. (See Table 2).

Table 2. Procure price markups received for high-quality wheat (average annual figures for the Tenth Five-Year-Plan period.

Области (a)		Объем заготовок (в %) (b)	Надбавки к закупочной цене (в %) (c)
По республике (d)		100	21,3
1	Тургайская	10,2	31,6
2	Актюбинская	3,2	29,9
3	Целиноградская	14,8	24,1
4	Кустанайская	20,6	23,8
5	Карагандинская	3,7	20,7
6	Кокчетавская	15,3	19,7
7	Северо-Казахстанская	9,0	18,9
8	Джезказганская	0,5	15,8
9	Павлодарская	4,5	8,6
10	Семипалатинская	3,1	8,5
11	Чимкентская	1,6	7,9
12	Уральская	4,9	7,5
13	Восточно-Казахстанская	3,4	6,5
14	Джамбулская	2,6	6,2
15	Талды-Курганская	1,7	4,5
16	Алма-Атинская	0,9	3,7

KEY: a - oblast; b - procurement volume (in per cent); c - markups over procurement price (in per cent); d - republicwide; 1 - Turgayskaya; 2 - Aktyubinskaya; 3 - Tselinogradskaya; 4 - Kustanayskaya; 5 - Karagandinskaya; 6 - Kokchetavskaya; 7 - Severo-Kazakhstanskaya; 8 - Dzhezkazganskaya; 9 - Pavlodarskaya; 10 - Semipalatinskaya; 11 - Chimkentskaya; 12 - Ural'skaya; 13 - Vostochno-Kazakhstanskaya; 14 - Dzhambul'skaya; 15 - Tal'dy-Kurganskaya; 16 - Alma-Atinskaya.

As revealed by analysis of the economic data, Ural'skaya Oblast farms are not adequately exploiting the financial potential offered by the strong wheat varieties; the average annual markup over procurement price here ran to only 7.5 per cent, while in neighboring Aktyubinskaya Oblast the figure was almost 30 per cent.

Great potential for improving grain quality still lies untapped within the oblasts themselves—at rayon, sovkhos and kolkhoz levels. Great variation is to be observed in this figure when we look at the rayons and farms of Turgayskaya Oblast, for example, where the highest procurement price markup goes for high-value grain. While the bonus paid for high grain gluten content in Yesil'skiy Rayon came out at 36.0 per cent (3.10 rubles per quintal of wheat procured), the figure was 29.9 and 22.7 per cent respectively for neighboring Zhaksynskiy and Oktyabr'skiy Rayons.

Over the course of the five-year-plan period just past the farms of Ruzayevskiy Rayon in Kokchetavskaya Oblast received an extra 2.27 rubles for each quintal of wheat turned over to the state for high gluten content, this amounting to an average annual payment of 3.1 million rubles, which raised profitability some 36.9 per cent. Neighboring rayons, on the other hand, which enjoy much more

favorable climatic conditions, are turning over less high-value grain. Arykba-lykskiy Rayon, for example, received only 0.48 extra rubles per quintal, Chistopol'skiy Rayon 1.64 rubles per quintal.

We can find the same potential for improvement in the southern oblasts of the republic as well. Talgarskiy Rayon in Alma-Atinskaya Oblast, for example, had 2.10 rubles per quintal above procurement price, while the figures were only 0.38 rubles for Enbekshikazakhskiy Rayon, 0.77 rubles for Iliyskiy Rayon, 0.47 rubles for Dzhambulskaya Rayon and 0.44 for Kaskelenskiy Rayon.

Production of the strong wheat variety and the additional processing it requires will of course entail a certain level of expenditure. But these expenditures are recouped through receipt of the procurement price markups.

To increase the proportions of our high-value varieties we must place our seed-growing programs on a higher level, rigorously adhere to a scientifically based system of farming and improve postharvest grain processing. Our republic is capable of producing high-quality grain in volumes bringing in 350-400 million extra rubles, which will make it possible for us to increase the profitability of our crop programs and create the conditions necessary for equalizing our farm economies.

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AGRO-ECONOMICS AND ORGANIZATION

BANK LOANS, COST EFFECTIVENESS ON UKRAINIAN KOLKHOZES DISCUSSED

Moscow EKONOMICHESKAYA GAZETA in Russian No 30, Jul 83 p 15

[Article by V. Pilipas, deputy director of the Ukrainian Republic Office of the USSR Gosbank, and D. Polozenko, candidate of economic sciences: "Bank Credit and Economic Effectiveness on Kolkhozes" under the rubric "Economics of the Agro-Industrial Complex"]

[Text] Recently some kolkhozes have been paying less attention to the financial aspects of their operations and setting aside little or sometimes no part of their income at all for replenishing indivisible assets, as well as diverting liquid capital for capital spending and showing no concern for repaying the credit provided by the Gosbank. In a word, they are attempting to operate at the expense of funds provided by the state.

What is Bank Credit Granted For

When asked what happens when the farm lacks the capital for funding production expenditures, farm managers answer: "The Gosbank has to be asked for help, which it will provide." The branches of the Gosbank have expanded their loan operations so much that certain farm managers assume that they are assigned state funds not for the purpose of making production more effective but for the purpose of offsetting financial deficits that arise not only owing to unfavorable weather conditions but also often owing to poor management and wasteful operation.

It is not difficult to obtain bank credit. The terms are extremely simple and can be grasped by any agricultural expert. Certain kolkhozes, particularly those operating at relatively little profit or at a loss, have in recent years begun to plan their expenditures without taking into account the extent of their own funds, exaggerating their gross output figures and relying on complementing their liquid capital with funds from impractical funding sources. Thus, the 1983 production-financial plan of the Kolkhoz imeni Dzerzhinskiy in Sumskiy Rayon, Sumy Oblast, specifies its need for liquid capital at the level of 2,172,000 rubles although its circulating capital amounted to only 18,200 rubles as of 1 January 1983.

And its overall need for short-term credits in 1983 was specified at 1,321,000 rubles. Of course, if such loans are to be granted and then repaid, production has to be developed, crop yields and milk yields have to be increased, and production cost has to be reduced.

It is characteristic that not only the kolkhozes operating at little profit as well as those operating at a loss do not replenish their liquid capital from their own incomes: this practice is also followed by certain economically strong farms. The "Podol'ye" Kolkhoz in Ternopol'skiy Rayon, Ternopol Oblast, had a mean annual profitability of 33.6 percent during the 10th Five-Year Plan and 31 percent during the years 1981-1982. But its funds were complemented with bank loans bearing an annual interest rate of only 1 percent. In our opinion, it is expedient to differentiate the interest rate on bank loans depending on the economic performance and period of utilization of the loan funds.

Kolkhozes widely engage in the practice of not only failing to replenish their liquid capital but also utilizing it for purposes other than stated. This affects their financial situation adversely and undermines cost effectiveness. Last year, the kolkhozes of the Ukraine diverted for unplanned purposes more than 700 million rubles. All this happened because the local agricultural agencies are not adequately monitoring the financial operations of kolkhozes or combatting tendencies of dependence as well as poor and wasteful management.

Norming is Needed

Kolkhoz economies depend on the formation of the consumption and accumulation funds. The recommendations applicable in the Ukraine provide that kolkhozes should allocate not more than 80-85 percent of their gross income for the wage fund. Many farms are indeed doing so. But certain kolkhozes violate this rule. The Kolkhoz imeni Kuznetsov in Sarnenskiy Rayon, Rovno Oblast, for example, in 1982 had set aside for its wage fund a much larger share of its gross income. Thus, the consumption fund included not only the newly created value but also a substantial part of liquid capital, including bank loans.

Rigorous monitoring of the formation of the consumption fund is needed, and it should be chiefly exercised by the branches of the Gosbank. They are expected to grant loans for the remuneration of the labor of kolkhoz members only within the limits of the approved yearly fund. To tighten adherence to these norms, in our opinion, it is necessary to fix for every individual kolkhoz the ceiling of expenditures on the remuneration of labor per output unit with allowance for their level during the last 5 years. This will promote adherence to the optimal ratio between the growth rate of labor productivity and the growth rate of the remuneration of labor.

As of this year, the procurement prices of agricultural output have been increased, funds are being allocated to the kolkhozes operating at little profit or at a loss to finance various social and cultural facilities, and surcharges on procurement prices have been introduced. The measures taken to strengthen kolkhoz economies require their organizational streamlining and improved utilization of liquid capital.

By contrast with state-run agricultural enterprises, the kolkhozes--with the exception of farms on which the [economic] experiment is under way--set no limits on their liquid capital. And yet setting such limits promotes an improved utilization of liquid capital and can at the same time improve credit relations with the Gosbank. Currently a number of the country's kolkhozes, including more than 35 percent of the kolkhozes in the Ukraine, are granted bank credit with allowance for their liquid capital norm.

Six years ago the kolkhozes of Kazatinskiy Rayon, Vinnitsa Oblast, were the first in the republic to convert to bank loans based on the norm of their liquid capital norm.

If a farm lacks capital of its own, it is granted credit for this purpose. With time, all the farms in Vinnitsa Oblast have converted to this system. They open bank accounts in which all their funds are deposited. These funds are used to pay for expenditures on basic operations. As a result, farm managers are able to monitor the income and outgo of farm funds. When bank loans are granted on this basis, the responsibility of managers and experts for replenishing and maintaining liquid capital is increased.

Since then the kolkhoz economies have strengthened. The mean annual growth rate of gross output during the first 2 years of the 11th Five-Year Plan reached nearly 12 percent. This was also definitely assisted by the new form of bank credit. It is characteristic that the growth rates of gross output in the rayon's kolkhozes are faster than the growth rates of credit investments. Now the granting of bank credit with allowance for the farm's own liquid capital is done in a number of the republic's oblasts.

Of course, it cannot be said that this form of bank credit is ideal. Some of its weak aspects have been uncovered. Thus, for example, the credit terms specify that the planned amount of liquid capital on hand at the kolkhoz at year end, with allowance for its replenishing in the course of the year, represents its norm of liquid capital, but that it should be at least 50 percent of the cost of the credit-based expenditures on uncompleted production carried over to the following year, along with remainder of young livestock being fattened, as well as along with the value of merchandise and materials on hand.

In the Ukraine a fairly large number of farms own liquid capital securing up to 50 percent of their expenditures. As a result, the loan demand increases. This complicates the prompt repayment of bank loans. Moreover, the 50-percent norm does not reflect the actual magnitude of the funds needed by a farm. It would be expedient to cut roughly in half the share of liquid capital funded with bank loans.

The current loan terms provide for granting 3-year loans to offset the shortage of liquid capital. But experience shows that this period is not long enough for all farms, especially those operating at little profit or at a loss, to accumulate sufficient liquid capital to amortize their bank loans. The loan period should be prolonged to 5 years.

Under the New Method

The Ukrainian Scientific Research Institute of the Economics and Organization of Agriculture imeni A. G. Shlikhter has developed a new method for determining the norm of liquid capital. It was approved by the Scientific and Technical Council under the Ukrainian SSR Ministry of Agriculture, on being somewhat revised. Thus, the norm of liquid capital for young livestock plus livestock being fattened is determined according to actual rather than planned cost. Other special features of the kolkhoz economy also have been considered. Currently the norm for liquid capital is determined by this method in three rayons within different natural-economic zones of the Ukrainian SSR. Calculations show that

the need of kolkhozes for liquid capital has as a result decreased instead of increasing.

The experience in granting bank loans to kolkhozes with allowance for their norms of liquid capital shows that the principal cost item is the remainder of young livestock plus livestock being fattened (cattle, poultry, other animals, bees). In sovkhoses, as known, the livestock remainder carried over to the next year is assessed in procurement prices. In kolkhozes such assessment is not done, and hence their production cost is much higher than in sovkhoses. This complicates the process of the formation of liquid capital, and it does not promote cost-effective operation and the utilization of the available material, manpower and financial resources.

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